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Drawing for Process Reproduction

181 Illustrations

By
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WITH ACKNOWLEDGEMENT TO
C. J. HAYES, CHIEF ILLUSTRATOR, I. C. S., FOR
CERTAIN DATA ON LINE AND HALFTONE
ENGRAVING METHODS

DRAWING FOR LINE ENGRAVING
RETOUCHING FOR HALFTONES
DRAWING FOR COLOR REPRODUCTION

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PREFACE

This volume, which is made up of Instruction Papers, or Sections, used in the Art Courses of the International Correspondence Schools, is designed to give the student reader information and training in the preparation of drawings and paintings that are to be reproduced as illustrations by means of printing plates made by the line, halftone, and color processes.

First, the line engraving process is treated, with detailed directions for the making of line, stipple, and mass drawings in black and white, for reproduction by this process.

Next the halftone process is described and an explanation is given of the mediums and methods, such as charcoal, wash, and air-brush retouching, that are used in the preparation of drawings to be reproduced by this process.

Third, the color processes, such as the quadricolor halftone, lithography, etc., are described, with very complete directions for the preparation of colored drawings and paintings to be reproduced by these processes.

It should, of course, be understood that more than the simple reading of the text of this book is necessary in order to obtain a training in drawing for the various processes of photomechanical reproduction. It is necessary actually to prepare the drawings and paintings as described in the text, if a training in this work is to be obtained.

All students of this book are urged to do all the work according to directions. If enrolled in any art school the criticisms of its teachers are available; otherwise the work itself and the student's self-criticism will help.

Grateful acknowledgment is here made to Mr. C. J. Hayes, Chief Illustrator of the publications of the International Correspondence Schools, for the excellent material he has furnished on the line and the halftone engraving processes. Mr. Hayes' service of over twenty-five years in supervising the illustrating of all I.C.S. publications, and the high character of these illustrations, furnish the best possible guarantee of the authoritative character of this material.

The reader must be reminded that the material in this volume is very advanced work, and that proper appreciation of it can be had, and the working out of the drawings and paintings can be done, only after one has a good understanding of the subjects of line drawing, model drawing, light and shade, the human figure, the figure in repose, the figure in action, animal drawing; pencil, charcoal, and crayon; pen and ink; wash and gouache; water color; oil color and pastel; parallel perspective; angular perspective; pictorial perspective; and pictorial composition. It is, therefore, suggested that the student procure —if he does not already possess them—the three preceding volumes of this series entitled, Still-Life and Figure Drawing, Black-and-White Technique, and Color Technique and Composition, in which the subjects mentioned are treated.

E. L. KOLLER.

Scranton, Pa.

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DRAWING FOR LINE ENGRAVING

(PART 1)

INTRODUCTION

PURPOSE

1. Preliminary Training for Commercial Illustrating.—A person applying his artistic training to some practical line of art work will find that such a start is usually made in the field of *commercial illustrating*. This general term is applied to all illustrating work of an advertising or mercantile nature that assists in the advertising and sale of goods, as distinguished from the purely pictorial character of newspaper, magazine, and book illustrations. The special art-department and drafting-room practices peculiar to commercial illustrating, and which will be discussed in this and subsequent Sections, are essential; but their full value cannot be utilized unless the student has been well trained in drawing and rendering, which have constituted the preliminary training given up to this point.

2. Scope and Method of Training.—The young artist must have a general idea of the nature of commercial illustrations, the methods of preparing the drawings employed, and especially of the *processes of reproduction*, or the making of metal printing plates from drawings. He must become familiar with the drawing and designing of the various classes of commercial illustrations, and must practice making original drawings

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for advertisements, catalog cuts, decorative lettering, cover designs, air-brush work, etc. It will be necessary, therefore, to devote a number of Sections to the presentation of this training.

The purpose here is to show the workings of commercial art departments, and particularly to train the student to make the pen-and-ink drawings used in the line process of reproduction.

The next Section will continue the discussion of the methods of drawing for line reproduction, and, particularly, special commercial techniques and practices, the making of drawings in stipple, on Ross papers, and with the aid of shading films, as well as other miscellaneous methods of preparing practical commercial drawings. Following, will be Sections devoted to decorative lettering and cover designing, retouching for halftones, and commercial illustrating in halftone and color.

3. Training for Practical Work.—For commercial illustrating, the artistic training in drawing and rendering, and the technical training in making drawings for definite process work or definite purposes, will be insufficient. They must be supplemented by actual practice in technique and especially in making such original drawings as would be required of the beginner in the photoengraving or advertising-agency art department. This practical training will consist in the preparation by the student of practical original drawings for definite processes and specific commercial uses, and their submission to the Schools for comments and helpful advice.

COMMERCIAL ART DEPARTMENTS

ADVERTISING AGENCIES AND PHOTOENGRAVERS

4. Function of Art Departments.—Drawings and illustrations for commercial purposes are prepared by the art departments of advertising agencies, photoengraving concerns, private illustrating companies or firms, and also by free-lance illustrators. The main purpose of the advertising agency is to plan and direct advertising campaigns for manufacturers of and dealers in various kinds of merchandise, to solicit their advertising, prepare copy for the catalogs, booklets, circulars, magazine advertisements, showcards, or posters to be used, and secure the necessary drawings and reproductions. Some advertising agencies maintain an illustrating department, while others depend on outside artists or photoengravers for their illustrations.

5. Importance of the Field of Commercial Illustrating.—Drawings for advertising agencies and for photoengraving companies are prepared in the same manner, and are reproduced by the photoengraving process. The illustrator will often be called on for an original design. Considerable lettering is usually required and the artist is expected to supply what is lacking in a rough sketch made to show the general scheme. The work in most offices is specialized, and a man who is a good letterer may know very little about designing, and still be considered a most valuable employe. Another may be a figure artist and the assistance of other specialists will be required to complete his work. The all-around artist who can draw a figure, do good lettering, and make a design and a finished drawing ready for the photoengraver is in demand.

The artist can find no better field for a display of commercial originality than in an advertising agency. Here he may sometimes be given a certain amount of material from which to prepare a rough sketch showing his own idea. In another instance, the advertising man will have a definite plan or rough sketch, will suggest the most prominent display in the design, and will sometimes go into the detail of the style of certain lines of lettering.

6. The demand for commercial illustrations, such as are used in catalogs, booklets, and circulars, is constantly increasing. Illustrations appeal to the public and speak a language understood and appreciated by all. Whether the reproduction be the picture of a great master, or of a mechanical device, it will be seen, appreciated, and understood by a far greater number of people than would read even a portion of the unillustrated description of the same subject.

All business houses recognize the value of the illustrated catalog. Mail-order houses, which do a great business in the United States, would not think of offering their goods for sale without an illustrated catalog showing the listed articles.

The advertiser realizes the importance of illustrations, and will sometimes pay a large sum for a drawing that will bring out the idea and will occupy a very much smaller space than an adequate description. The modern automobile catalog, for careful detail and technical excellence in illustration, marks the highest point in dignity and elegance yet attained in the technical trade catalog. The highest grade of photographic work, retouching, and draftsmanship has been employed in the illustrations.

7. Diversity of Commercial Illustrations.—Material for illustration on almost every conceivable subject reaches the art rooms of the photoengraver and the advertising agency. All this miscellaneous work is given to specialists skilled in the preparation of drawings for the photoengraving process. Letterheads, billheads, trademarks, and seals are to be designed and finished drawings need to be made.

An illustrated catalog may be ordered. A dummy, already planned in a general way by the advertising man, shows the number of illustrations desired and an approximate amount of space that the finished engravings are to occupy. A cover page is also to be designed and hand lettering used instead of type. Perhaps an illustration of a device itself is desired on the cover.

The advertising man may suggest that the catalog would be improved by ornamenting the inside pages or perhaps by using drawn headings instead of type. Photographs of mechanical devices to appear throughout the booklet are to be treated in an artistic manner by the retouchers.

The half-tone illustrations of the catalog may be printed in a different ink from the type matter. To avoid a too mechanical effect, the photos may be blended or vignetted, so that the edges of half-tone illustrations may extend underneath the type matter.

8. The material for wash drawings of mechanical devices may be in the form of a blueprint or working drawing; or a machine may be so located that no good photographic view can be obtained, and the machine must be sketched. If a manufacturer wishes to forestall competition on a new style of machine his advertising matter may be illustrated by a wash drawing, made to represent a photographic effect in light and shade.

The agriculturist wishes to sell a farm, and a sketch or plan showing location and important details of buildings, orchards, etc. is furnished and a bird's-eye view made. Magazines and trade papers require many illustrations and men skilled in all classes of work are in demand to produce them. The vast number of catalogs produced each year furnish work for both designers and mechanical artists.

Great numbers of fashion drawings are made, mostly by firms who specialize in that line. Very little of this work, except the reproduction of the drawings, is done by the photoengraver. Sketches of posters are generally prepared by artists and the work is finished by lithography, which is a more economical method than photoengraving for large work of this kind. Illustrating medical publications demands careful, painstaking work.

9. Some mechanical devices cannot be clearly understood unless a transparent view, showing the interior, is made. In other cases, certain parts are broken away to show the interior construction. A large machine may have an attachment which is to be brought out conspicuously in the catalog illustration. The machine is subdued in color and the attachment strengthened, all of which requires the work of the artist. Guide books to summer resorts annually furnish considerable art work in ornamental arrangements, lettering, and retouching.

The artist acquires much valuable experience while searching in libraries, museums, etc. for the data required in the preparation of illustrations for encyclopedias and reference books.

Jewelry, silverware, and cut-glass illustrations for catalogs, booklets, and advertisements require retouching, as these articles seem more or less distorted by reflections. This defect is partly counteracted by dulling the surfaces of the objects, but the retouching is usually necessary to get good reproductions. This list could be extended almost indefinitely.

10. Requirements of Commercial Illustrator.—The trained commercial artist should be able to prepare his drawing in such a manner that it will have advertising value as well as artistic merit. The illustration that fails to attract and convince the public has no commercial worth. Hence, the artistic portion of a commercial illustration must not interfere with its strength as an advertisement. The space allowed for an advertisement picture, as a rule, affords the artist but a limited opportunity for the exercise of his ingenuity, and he must always remember which parts are to be made most prominent. If type matter is to be set, due allowance must be made. An artist can seldom draw in whatever medium, size, or proportion his inspiration suggests to him. The most successful artists in this line of work are those who can grasp the advertiser's viewpoint, usually a commercial one, and then draw the design accordingly.

THE HEAD ARTIST

11. The head of the art department is responsible to the firm for the quality and quantity of work produced by the men under him. He very often estimates the cost of making drawings and decides whether estimates can safely be given on certain drawings which may require considerable time in developing, or perhaps experimenting, before results are obtained. This class of work is done at a fixed hourly rate. The employes in an art department are usually engaged by the head artist, as he must decide whether the person in question is capable of filling the situation. The head artist usually instructs the men under him the various details of the work and sees that the customer is suited; he also informs them how much time can be spent on the work, to bring it within the estimated price. He suggests, when necessary, the style of treatment most suitable for the class of work desired. If an original design is required he usually explains his views to the artist and perhaps furnishes him with rough sketches, showing the main idea. This is not a hard-and-fast rule, as much depends on the artist who does the work.

A man with ideas is usually permitted to submit rough schemes to the head artist; if found suitable, a more finished design is shown to the customer. In successful designing, much depends on the ability of the artist who does the work to follow suggestions. A certain amount of material is required by some artists, to act as suggestions in the development of new ideas. Some designers are greatly helped by studying good specimens for a short time before beginning a new design.

12. The head artist is not supposed to be an expert in all the various branches of commercial art, but he has a broader view of the business and a better idea of the kind of drawing wanted for the purpose, and prevents the waste of time on impractical drawings. He must use considerable judgment at times in giving out work to the right man on the artists' staff, so that the result will be satisfactory and profitable.

THE ARTISTS' STAFF

13. The modern art department is a well-balanced organization of specialists. The artists may be classified under two heads; namely, *designers* and *mechanical men*. The designer originates and interprets ideas, and his work consists in making illustrations for books, magazine or booklet covers, and publicity drawings.

The mechanical artist prepares drawings from rough sketches, makes illustrations of goods for manufacturers' catalogs, retouches photographs, and does neat lettering and label work. An artist capable of all these things is seldom found. Some men are more facile with the pen than the brush, and each man is usually kept to his specialty and in the medium in which he is accustomed to work. Advertising agencies and photoengraving companies employ regularly artists who specialize in poster and fashion work in retouching, in mechanical drawing, in decorative work, in lettering, in landscapes, in figures, and in cartooning. The mediums used are pen and ink, charcoal, crayon, wash, water color, body color, or oils.

An artist should strive to be creative and to do original work. Frequently the advertising man or customer furnishes a rough sketch and the head artist decides how closely this material is to be followed. Very often the design furnished is very bad from both the advertising and the artistic point of view. The head artist usually specifies just how much latitude may be taken and still retain the main points of the customer's original idea.

14. Work By Outside or Free-Lance Artists.—The class of work usually given to men conversant with certain kinds of drawing, who have studios where their orders may be successfully executed from models or other data, may be figure work, lettering of a certain kind, or drawing of animals. When there is more work than can be done on the premises, outside artists are sent for. These men usually have offices and depend entirely on work they obtain from firms engaged in manufacturing, publishing, and other pursuits, as the demand in large cities for illustrations for commercial purposes is very great. An artist should be well trained in drawing before he attempts to become a free lance. Drawings are usually wanted quickly and the artist should be able to give a reasonable estimate of the time required and the cost of the work.

15. Apprentices.—The apprentices of the art department are obtained by taking on prospective artists who apply and exhibit specimens showing that they have a certain amount of talent which may be developed. Some young artists progress very rapidly, particularly those who continue to study art and find great pleasure in drawing. These beginners usually get their start from training courses in commercial art and very soon make drawings that can be reproduced and have a commercial value.

16. Experienced Artists.—Experienced men are very often difficult to get, as the field is not overcrowded with competent artists. The experienced artist usually has plenty of work, particularly if he can do several kinds of work. When a great deal of lithographic hand work was superseded by mechanical processes, many men drifted into photoengraving. Some artists prefer to work at home or in an office by themselves, where they are not restricted to regular hours and are supplied with work from engraving companies, publishers, and other sources.

Artists who have had a systematic and practical training are always in demand, as they can readily adapt themselves to the needs of the art department. While natural ability plays an important part in certain kinds of drawing, the painstaking, careful worker is very often more successful commercially. The art department demands neat and careful work, so that perfect reproductions can be made. The student who is not gifted with creative genius need not worry, as sufficient drawing must be done which requires only cleverness and adaptability. In an advertising-agency art room there is a great demand for well-trained artists to make neat and carefully executed drawings from instructions given. Original designers usually command good salaries, more particularly when their ideas can be readily applied to commercial use. Fig. 1 shows the artists' staff of a typical art department; the various specialists are engaged on their work, while the art director or head artist passes from one to the other, giving directions and advice.

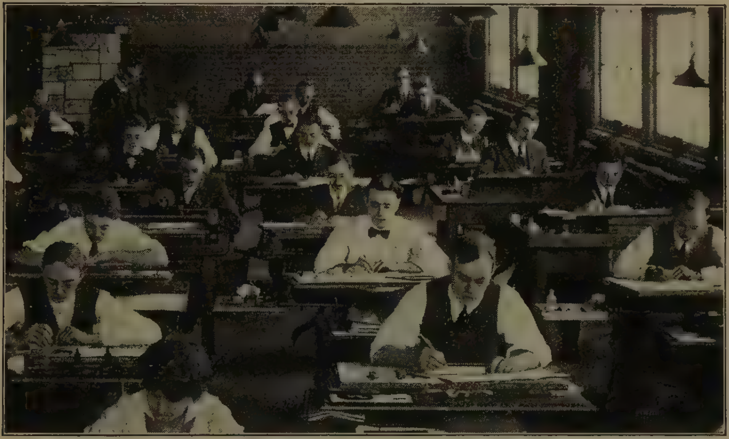


Fig. 1

LINE PROCESS OF REPRODUCTION

MAKING THE PLATE

17. Principle of Photoengraved Plate.—Drawings for commercial-art purposes must be duplicated so they can be issued in large quantities. The usual method of duplicating the illustration is to convert the drawing by some process into a printing plate. This plate can be printed in the same way as type.

The method most generally used for this purpose is the photoengraving process. An illustration of a photoengraved plate is given in Fig. 2, which shows a zinc plate, portions of the surface of which have been etched with acid, thus leaving the other parts standing in relief. To bring this zinc plate to the height of standard type, that the two may be used in conjunction, it is mounted with nails on a wooden block. Fig. 3 shows an impression made in printer's ink on paper with this

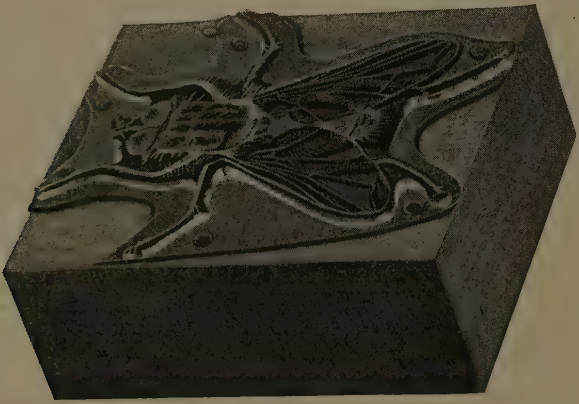


FIG. 2

same plate; in this impression, only the parts appear that, on the zinc plate, were in relief.

18. Classification of Reproductive Processes.—Three processes are used in reproducing drawings for relief plate printing: line engraving or zinc etching; halftone engraving, and wood engraving. Line and halftone engraving are classed together as photoengraving, or process engraving. Photoengraving is a process by which a design or image is, by means of photography, transferred to a metal plate, which is then etched, or cut away, by chemical and mechanical processes. Therefore, the general principle of cut making, briefly stated, is to put a design on a metal plate and to cut away by hand, by machinery or with acid, such portions of the plate as are not desired in printing the finished illustration.

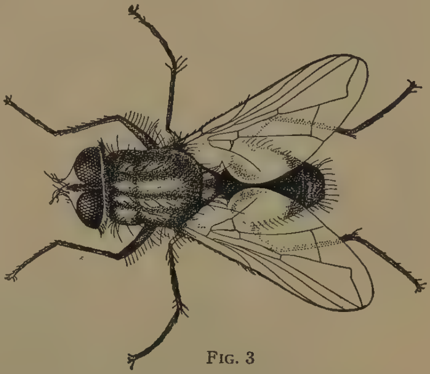


FIG. 3

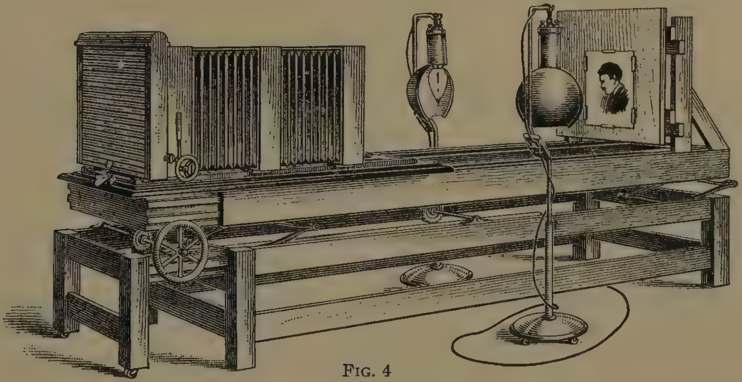


FIG. 4

19. Photographing the Drawing.—A completed drawing, on which the dimension of the required cut or block has been marked is given to the photographer, who makes from it a negative of the required size. The drawing is fastened to a board and placed in front of a camera, as shown in Fig. 4, which differs in principle from the ordinary camera only in the construction of the plate holder, which is made to accommodate wet plates instead of dry plates. Wet plates are sensitized by the photographer as required and are used while wet. After the camera has been focused so that the image of the subject is sharp on the ground glass and of the correct size, a plate holder containing a wet plate is put in the camera, the exposure is made, and the plate holder taken to the dark room, where the wet plate is developed and fixed. The resulting negative is then intensified to render the ground sufficiently opaque to prevent the passage of the light, which would render the negative useless for obtaining a clean, sharp print on metal. If the negative in its present state were printed on the metal, the illustration when printed on paper from the etched zinc plate would appear in reverse, right to left in position, so the negative must be turned. It is therefore coated with a rubber solution over which, when dry, a coating of collodion is flowed, which is also allowed to dry. The rubber makes the delicate film more durable when it is stripped from the glass, and the collodion causes the film to adhere to the clean glass on which it is to be transferred.

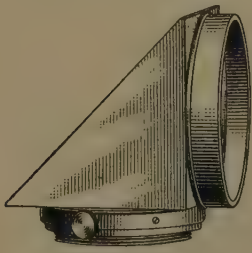


FIG. 5

The negative is then cut with a sharp knife around the image and placed in a tray containing a solution of acetic acid and water. In a short time the film may be lifted, reversed, and laid on a clean piece of glass, The negative is dried over a gas stove or in a drying box and is then placed in a rack to cool.

20. A device shown in Fig. 5, called a *prism* is sometimes used to secure the reversal of the image without stripping the negatives. The prism is attached to the mounting of the lens and is used extensively when subjects are to be an exact size, or when an accurate matching, or *register*, of plates is required, as in color work.

21. Printing Negative on Zinc Plate.—A piece of polished zinc plate is now carefully washed, coated with a sensitizing solution, and dried over a gas stove. This operation is conducted in the dark room, as the zinc plate becomes sensitive to light. The negative is now placed in contact with the sensitized zinc, the film side against the metal, in a strongly constructed printing frame, as shown in Fig. 6. The negative and zinc plate are held in perfect contact by the screw *a*. The printing frame is then exposed to sunlight or a powerful arc light, and an image from the negative is produced on the zinc plate. In the dark room the exposed zinc plate is removed from the printing frame and developed as follows:

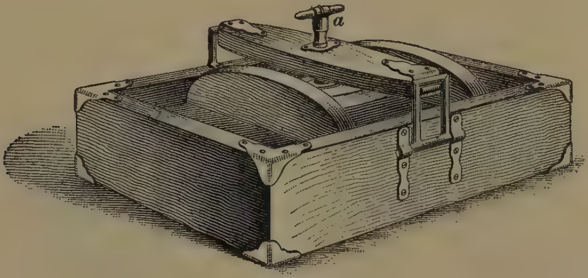


FIG. 6

To obtain the image, a composition roller charged with a special transfer ink is rolled over the zinc plate, which is then placed in a tray of clean water, or held under the tap. As all parts on the zinc plate that have received the light through the negative have become insoluble, when the plate is gently rubbed with a piece of absorbent cotton, the parts that were obscured from the light are easily removed because soluble, leaving the image clean and sharp on the zinc plate. After the plate is drained and dried by warming, it is prepared for the etching process. Large open spaces in the image and around the margins of the plate are painted over with an acid resist, such as asphaltum, which facilitates the etching by presenting the minimum amount of metal to the action of the acid and forms bearers for the support of the ink rollers in subsequent etching and proving.

22. Powdering the Plate.—The zinc plate is now sprinkled with powdered dragon's blood, the surplus being removed with a soft camel's hair brush. The dragon's blood adheres to the inked portion, which has remained sufficiently "tacky" to take the powder, and when this plate is heated the dragon's blood melts and combines with the ink and thus forms what is termed a "resist" for the acid. The back of the plate is also coated with asphaltum and allowed to cool; the plate is then ready for the first bite in the etching bath.

23. Etching the Plate.—The zinc plate is now placed in an etching tub containing a weak solution of nitric acid and water, where it is rocked gently, and in about 5 minutes the metal will be etched sufficiently to show lines in relief. The plate is then removed, dried, and warmed. The plate is too shallow for printing, but before another bite can be taken, the sides of the lines must be protected and the acid prevented from undercutting and causing breaks in the lines. Powdered dragon's blood is sprinkled on the plate and brushed from one edge with a soft, flat brush, so that it banks up against the lines, which are protected from the acid by the powder, which is then *burned in*. The process is then repeated from each edge of the plate in turn. The plate, now ready for the second

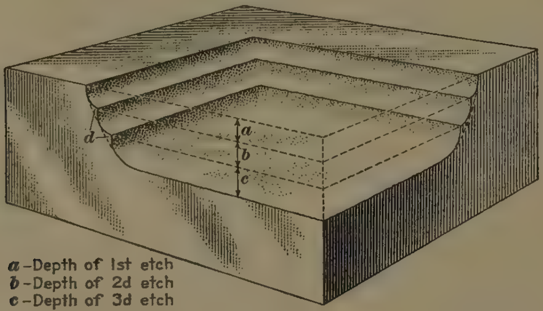


FIG. 7

bite, remains in the acid a little longer, is again removed, and the powdering and burning in are repeated, until the plate has received three etchings, which is usually sufficient to obtain the proper depth. After the etching is complete, all the coating is removed by scrubbing with lye. Fig. 7, a greatly enlarged view of a portion of a zinc etching, shows that the acid does not etch straight down, but forms a series of steps which, if unduly prominent, will make a shoulder that is likely to come in contact with the paper when printing. To reduce this shoulder, the plate is given one more etching, called the *finishing etch*. The plate is again *rolled up* with transfer ink, powdered, and burned in. Only the top surfaces of the lines in relief receive the ink and powder. The plate is then placed in a weak acid solution, which removes the shoulders *d* in a few moments.

24. Machine Etching.—Several types of etching machines are in the market, which are designed to supersede hand etching. For certain classes of work, such as coarse-screen halftones and open-line work, these machines are economical and satisfactory; but as their work cannot be as closely watched as hand etching, they are less suitable for the highest grades. The action of the acid on the plates is sometimes severe and liable to undercut the lines.

The Axel-Holstrom type of etching machine operates as follows: The acid is placed in a rectangular earthenware compartment and the plate to be etched stands almost vertically on a projecting shelf on one side of the compartment, but above the level of the acid. A paddle wheel in the same compartment is driven by a motor. When a plate is to be etched, the revolving paddle wheel carries the acid in an upward direction, so that it strikes a projecting shelf and is distributed in the form of coarse spray. The action of the acid on the plate quickens as the speed of the revolving paddle is increased. The acid spray combined with the oxygen from the air assists the etching and precipitates the oxide. After the first bite, the plate is removed from the compartment and washed. The powdering and burning-in process is proceeded with in the usual way. Some etchers find the use of this machine economical for certain stages of the work, but finish the etching by hand.

Another well-known etching machine is the Levy acid blast, which operates on a somewhat similar principle. The etching of the plate is accomplished with finely atomized acid, which is sprayed against the plate by compressed air and produces a deeply etched plate. The use of etching machines is far more healthful to the operator, as the acid vapor is conducted through a vent pipe to the open air instead of being allowed to escape into the room.

25. Finishing the Plate.—The plate, after being etched, is given to the pressman, who makes a few proofs to be used for reference by the engraver and router. A routing machine removes the blank metal from the larger open spaces, to insure greater depth and thus prevent these parts from coming in contact with the paper when printing. The plate to be routed is clamped to a bed and cutting tools of various sizes are attached to a spindle head, which is adjusted to move in any direction. The engraver then inspects the plate, carefully, and trims and cleans out any lines that have partly closed in, or shoulder left by the acid, and if desired will soften edges by cutting, or by using a tool called a *roulette*, which cuts the lines into very fine dots. The plate is then properly mounted by the pressman and proofs are struck off. The plate and proofs are now ready for delivery.

ELECTROTYPING

26. Electrotyping is not considered a part of the photoengraving process, but it has such an intimate connection that a brief description follows.

When duplicates of original engraved plates are required, either to preserve them from damage or wear, or to produce a number of printing plates exactly like the original, they are made by electrotyping. The surface of the photoengraved plate is thoroughly brushed over with graphite. This plate is then placed face downwards on warm beeswax and a uniform pressure applied; when removed an exact impression is left in the beeswax, but in reverse to the plate from which it was made. This wax impression now becomes a mold and all open places that are shallow and may cause difficulty by coming in contact with the paper in printing are built up with hot wax. Every portion of the mold must be thoroughly rubbed and polished with graphite or black lead, that the mold may be made conductive to electricity. The wax mold is then suspended by copper hooks in a tank containing a solution of sulphate of copper. Facing the mold and suspended in a similar manner is a sheet of copper. A dynamo generating a powerful current of electricity causes the atoms of copper to leave the sheet and deposits them on the wax mold. The thickness of this deposit depends on the length of time the current flows. When this shell of copper is of sufficient thickness it is removed from the wax mold, laid face downwards, and a thin sheet of tinfoil laid on it; the copper shell is heated and the tinfoil melts, the purpose being to prepare a surface to which the backing metal will attach itself when poured on. This backing metal is composed of lead, tin, and antimony. When cool, the electrotype is examined by a finisher, who levels the surface by hammering on the back of the electrotype, which is then shaved by a machine to the thickness of what printers call 11 points; that is about $\frac{1}{6}$ inch, and blocked on wood to the height of standard type.

STEREOTYPING

27. Stereotyping is a process by which line engravings or type forms may be duplicated to preserve the originals from damage or deterioration in printing. A thin sheet of composition made of paper and other ingredients is softened by soaking in water so that an engraving may be pressed thereon and leave an exact impression. The sheet of composition is laid on a hot plate while being impressed, which hardens the composition, so that when the original plate is removed a perfect mold or matrix is produced. The matrix is then placed in a specially constructed casting box and hot lead is poured into the box, making a casting of all lines and dots shown on the paper matrix. The lead plate is then removed and the back planed smooth and mounted on wood ready for the printer.

When making newspaper illustrations, all work is open, that is, the lines are far enough apart to stereotype well. While not as good as electrotyping, stereotyping is suitable for certain classes of work.

DESIGNING AND DRAWING COMMERCIAL ILLUSTRATIONS IN LINE

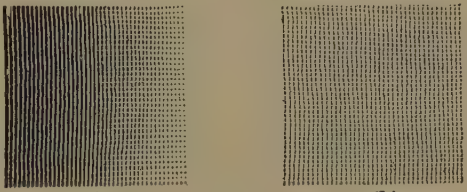
MATERIALS AND METHODS OF WORK

MATERIALS

28. Paper or Bristol Board.—Pen drawings for reproduction are best made on bristol board or a good grade of white bond or unglazed photographic paper used by engravers and mounted on cardboard. Pen drawings made with black ink on tracing paper or cloth reproduce satisfactorily.

29. Black Drawing Ink.—The use of absolutely black ink is essential to satisfactory engraving. The ink should not be thinned, as good results are only obtained by clean black lines properly spaced. Waterproof India ink is the best to use for making line drawings for engraving purposes, as there is less liability of the line becoming brown by being rubbed in handling or blurred by bleaching if the drawing has been rendered over a silver print. This process will be described later.

30. White Drawing Ink and Its Use.—White ink is a pigment used by pen artists mainly to cross-line black lines with white ones in order to blend line shading into the white paper and thus avoid hard edges. The brand of white ink that has given the most universal satisfaction is Winsor & Newton's Flake White, purchased in cake form. It stays white longer and photographs whiter than other kinds. Some whites are too gummy to use in a pen satisfactorily, or discolor easily. A cake may be put in a small dish and water added, and when the cake has become soft it may be mixed up well so that all lumps are dissolved and of the proper consistency to flow freely from the pen, and also have sufficient covering power.

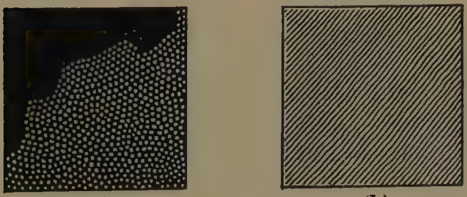

(a) FIG. 8 (b)

31. Fine black lines tend to print heavy at the extreme edges of a graduating tint. To help the graduating effect and produce a soft edge, the white-ink lines should be made tapering and spaced so that the first fine black line which is cut with white ink forms a tiny square and each succeeding black line that is cut with white ink gradually becomes longer, as the white-ink lines extend in the darker part of the tint, as shown in Fig. 8 (*a*). Flat tints composed of black lines may be lightened in tone and altered in texture by cross-lining with white-ink lines, as shown in Fig. 8 (*b*).

32. White ink is also used to get a stippled effect on a black ground, as shown in Fig. 9 (*a*). The white must be ground fine and be of the proper consistency, when mixed in the dish. It should cover well and not appear bluish in color on the drawing.

When preparing drawings of a mechanical nature, line tints intersecting outlines may be improved by passing a fine white line between the tinting and the outline, as shown in Fig. 9 (*b*).

Working with white ink requires more skill than with black ink, and its use should not be abused. White ink is employed sparingly and should not be depended on in making alterations. When a line extends beyond the point desired, or two lines are to be separated, white ink may be found useful.


(a) FIG. 9 (b)

33. Drawing Pens.—The most serviceable pens for freehand work for line drawings are Gillott's No. 290, which are very flexible and give a wide range of lines. When this pen has been broken in, so to speak, it will produce a beautiful line which may be varied by the slightest pressure.

Possibly the next pen in order is the crowquill, which is less flexible and is best suited for small lettering, though some artists employ it almost entirely.

Gillott's No. 170 and No. 303 are good pens for outlining, as the points are less easily spread and therefore a uniform line may be readily maintained. They are good for the coarser grade of lettering, such as is used on mechanical drawings. The life of these pens is short in comparison with the No. 290 and the crowquill. Other grades of coarse pens may be used for large drawings and for freehand tints of a special texture.

34. Parallel Rule.—A device for making tints composed of parallel lines, called a *parallel rule*, as shown in Fig. 10, will be found very serviceable. When a drawing is not tacked to the drawing board, and a tint is to be ruled, the parallel rule is more convenient to use than two triangles. The bar *a* may be set to a given line and the bar *b* held firmly, while the bar *a* may be moved gradually downwards at distances equal to the amount of space desired below the given line.

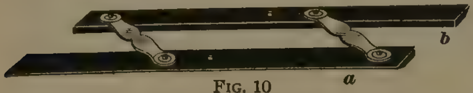


FIG. 10

35. Drawing Instruments and Drawing Board. Although the work of the commercial illustrator is purely pictorial, and largely freehand, much of it requires great accuracy in laying out. For this reason there are needed a drawing board (about 16 in. × 22 in.), a **T** square, a 45° triangle, a scale rule divided into sixteenths of an inch, an irregular curve, and some drawing instruments, such as pencil and pen compass, a pair of dividers, a ruling pen, etc. Several small red or black sable brushes are also desirable to fill in solids. If such a supply of material is not already possessed by the student, he should secure them at once.

METHODS OF WORK

36. Relative Sizes of Original Drawing and Reproduction.—Drawings for reproduction are made to a larger scale than the finished plate. The artist finds this custom of decided advantage in the perfection of detail, and the photographer, when reducing the drawing, gives the work a more finished appearance by cleaning up the lines and little imperfections in tints. To reproduce high-grade work, drawings must be made necessarily to a larger scale, so that all imperfections may practically disappear in the reduction.

When making a reproduction the same size as the drawing, the work tends to appear coarse and the lines to become ragged. Large open subjects, bold in outline or where roughness of lines or texture is a feature, and also large newspaper drawings, will reproduce clean enough for the purpose for which they are intended, if made of the same size as the finished picture.

37. The artist may also do certain other work the same size as the reproduction is to appear, such as lettering; but if clean sharp work is desired, a *chalk board*, sometimes called *scratch board*, should be used, the surface of which is very smooth and shows no grain or texture. Sufficient accuracy therefore results to make a reduction unnecessary.

Artists who work on metal plates must necessarily work same size. A detailed description of this work will be given after the technical details of the engraving process have been explained.

38. No standard sizes are adopted by artists in preparing line or wash drawings for reproduction. Drawings prepared in studios are usually made larger than is customary in a photoengraving plant, as the work is of a somewhat different character. A good rule is to make a drawing sufficiently large to get accurate detail and freedom to do the work properly. Drawings of most commercial subjects are large enough if prepared double the size of the finished engraving. For rather large open subjects, such as large, plain, hand-lettered catalog covers, ornamental arrangement for type pages, or for grouping photographs, one-third reduction is ample. It is not advisable to make a drawing larger than is necessary to get perfect detail and sufficient reduction for cleaning up in the process. It takes longer to go over a large surface, and in commercial work time and cost of production are generally considered important.

39. Laying Out Drawings for Various Scales of Reduction.—When a line drawing is to be made for reproduction, the height and width of the finished engraving should first be decided on. The drawing can then be made in correct proportion. A diagram, as shown in Fig. 11 (*a*), is most serviceable for this purpose. The tinted rectangle *a b c d*

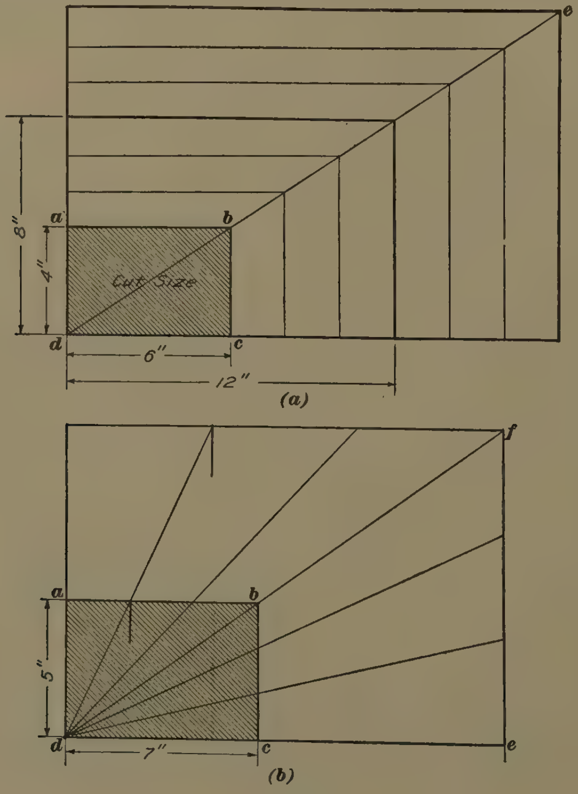
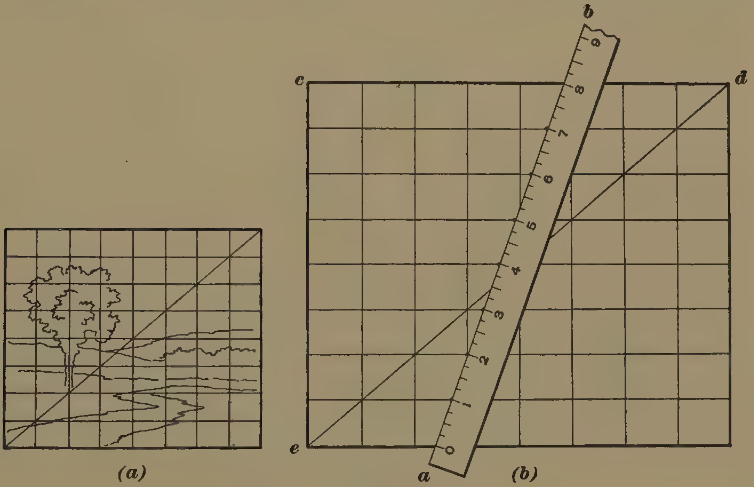


FIG. 11

indicates an engraving measuring 6 inches wide by 4 inches high. A diagonal line *d b* drawn across this tinted area and produced indefinitely is the next step. Any vertical and horizontal line intersecting on the diagonal line *d b e*, will produce a rectangle that will be in the same proportion as the tinted rectangle *a b c d*. If a drawing is to be made double the cut size, the height and width would each be made double, making the drawing 8 by 12 inches. The vertical and horizontal lines at these measurements intersect on the diagonal line *d b e*, and show that it is in correct proportion to the required cut. Only linear dimensions are considered in engraving; a drawing marked "reduce ½" will mean a cut one-half the height and one-half the width, and the resulting cut is only one-quarter of the area.



(a) (b)

FIG. 12

The foregoing diagram may be employed in finding other points at proportional distances as shown in (*b*), and will be found useful when copying a drawing to a large scale. A line drawn from the point *d* to a point along the boundary of the tinted area and produced until it intersects the outline of the larger rectangle, locates the point correctly. Other points may be located in a similar manner.

40. A series of cross-lines drawn on a piece of tracing paper and fastened over a picture to be copied is sometimes used, as shown at Fig. 12 (*a*), to facilitate sketching a subject to a larger or a smaller scale, or if the original is of no special value, the cross-lines may be drawn on it direct. The lines of the pictorial portion are then sketched in in the same relation to the large squares as they occupy to the small squares in (*a*).

To divide the rectangle on the larger drawing, view (*b*), into a number of equal spaces quickly, and to avoid stepping off these distances with the dividers, an inch rule or scale may be used. A number of equal divisions are found on the rule, the combined number measuring a greater distance than the space to be divided, and the scale is then adjusted at such an angle that these divisions will include the limits of the drawing, as indicated. After the vertical distances have been pointed off on the paper along the edge *a b*, lines parallel to *c d* may be drawn, and where these lines intersect a diagonal line drawn from *e* to *d* will locate all the horizontal divisions of the rectangle.

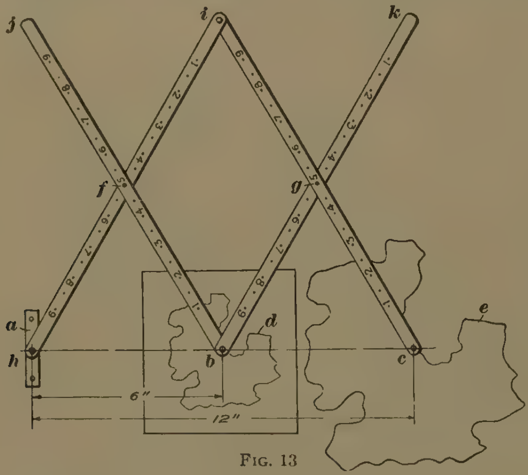


FIG. 13

41. The Pantograph.—A pantograph, shown in Fig. 13, is an instrument used in copying a drawing or photograph to a larger or smaller scale. The general working principle is very simple. The clamp *a* is fastened to a drawing board; a tracing point *b* is carefully moved around the outline of the picture to be copied and at the pencil point at *c* this same movement is transmitted and a line drawn on the paper, but to a larger or smaller scale. The main difficulty in the use of this instrument is in the adjustment of the arms to produce a drawing of specified scale. In Fig. 13, the necessary enlargement is assumed to be twice the size of the original, which is shown at *d* and the enlarged copy at *e*. In setting the instrument the two screw eyes *f* and *g*, which connect the arms where they cross, are first removed, and the clamp *a* is attached to the drawing board at the left-hand side. Then, on a line *h c*, extending from the pivot *h*, to the right, any convenient distances, in this case 6 and 12 inches, the latter dimension being just twice the former, may be marked off, as at *h* and *c*. The connected arms *h i* and *i c* are extended until the pencil point at *c* rests on the 12-inch mark. Then the connected arms *j b* and *b k* are arranged as shown, with the tracing point at *b* resting on the 6-inch mark. The arm *b j* must be parallel with the arm *c i*, while the arm *b k* must be parallel with the arm *h i*. In the illustration, the arms cross at holes marked 5, where the screw eyes are inserted and adjusted. The screw eyes must enter only the holes which bear the same number on each of the four arms, otherwise a distorted enlargement will result. Enlargements of any size within the scope of the instrument can be made in similar manner. Some instruments have a scale on the arms which shows at once where to place the screw eyes to obtain any desired enlargement. In any case, one arm of each pair of connected arms must be arranged parallel to one arm of the other connected pair, regardless of the size of the enlargement.

42. Proportional Dividers.—A proportional divider, shown in Fig. 14, will often be found useful and a time saver when copying a drawing to a larger or smaller size. The instrument may be adjusted by loosening the thumbscrew *a* which permits the piece *b* to slide in the slot *c*. On each side of the slot is shown a scale. The piece *b* is slid along until the mark on it coincides with one of the marks on the graduated scale. The dividing points may now be set and the points opposite will measure a definite enlargement or reduction.

43. Proportioning Widths of Border Rules.—An advertising design is often to be bounded by a rule (that is, a line or band) of specified thickness, so as to connect it to printer's brass rule of standard dimension. The artist should therefore know the system of measurement used by printers and should be acquainted with the various sizes of rules most commonly used. The American printer uses the recognized standard of measurement for type, borders, and rules, which is known as the *point system*. Its basis is the *point*, which is approximately $\frac{1}{72}$ inch. In Fig. 15 (*a*) are shown brass-rule borders in sizes from 1- to 12-point thicknesses. The sizes of rules generally used are 1, 2, 3, 4, 6, and 12 points. If a sketch is marked to use a border that will match a 6-point rule, a border line on

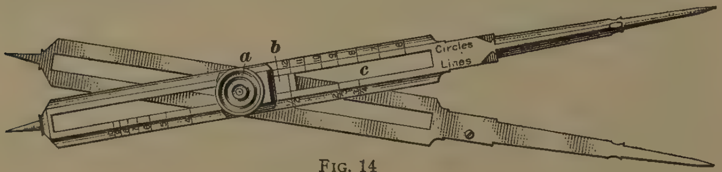


FIG. 14

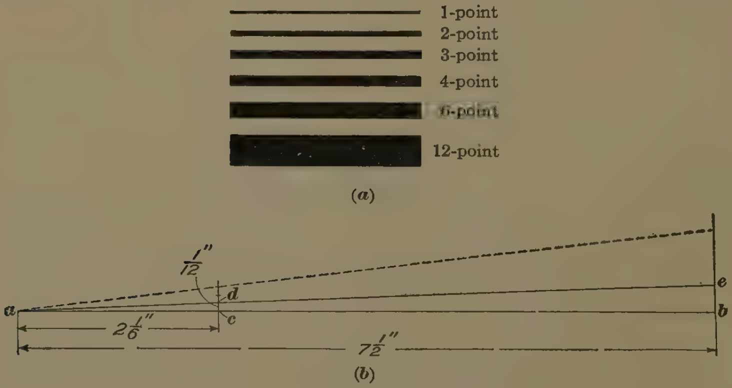


FIG. 15

the drawing when reduced should measure $\frac{8}{72}$ or $\frac{1}{12}$ inch thick on the engraved plate.

The point system is used for measuring both the length and thickness of rules. For example, a standard newspaper column measures 156 points wide, or $2\frac{1}{6}$ inches. This measurement is specified in *picas*; 1 inch is divided into six parts, each part, known as a pica, being equivalent to 12 points. A newspaper column therefore measures 13 picas, or $13 \div 6 = 2\frac{1}{6}$ inches. When sketches are to have a border rule to match a pica rule, $\frac{1}{6}$ inch thickness is meant. When a sketch is marked in ems, it is understood to mean picas, as they are synonymous in this case, both being equivalent to $\frac{1}{6}$ inch. Specially divided scales, such as are used by printers, will be found useful to the artist engaged in advertising design work.

44. An accurate method is here given of laying out the thickness of a border, so that when reduced it will match a standard printer's rule. When a drawing is made either one-half larger or double the size the thickness is easily found; but when made to an odd dimension the thickness may be obtained by using a graphic method, which is the easiest way for the average artist. If a drawing is made $7\frac{1}{2}$ inches wide and is to be reduced to $2\frac{1}{6}$ inches wide, with a border that when reduced will match a rule $\frac{1}{12}$ inch in thickness, begin by drawing a line $a\,b$, $7\frac{1}{2}$ inches long, the actual width of the drawing, on a separate piece of paper, as shown in Fig. 15 (*b*). On this line set off, from a, a distance of $2\frac{1}{6}$ inches, locating the point c. From this point draw a vertical line of indefinite length and another from point b. With a small divider lay off on the vertical line from c, an amount equal to $\frac{1}{12}$ inch, thus locating the point d, through which a diagonal line is drawn from a and produced until it meets the vertical line b in point e. Then $b\,e$ is the thickness the rule is to be made on the drawing. As the measurements are small, the diagram must be very accurately drawn to be of real service. Note that the diagram in Fig. 15 (*b*) is only one-half the size described.

When the accurate projection of lines from a thin rule is difficult, the thickness as shown may be doubled or trebled, and a dotted line may then be projected until it intersects the line *e b*, at which point the distance can then be subdivided and a more accurate measurement obtained.

45. Centrolinead.—When preparing large perspective drawings, the vanishing points often extend beyond the edges of the drawing board. To overcome this difficulty a device called a centrolinead may be purchased; directions for its use accompany each instrument. A simple home-made device will answer the purpose for most drawings and may be constructed from card-board as follows:

The vanishing points are first definitely located, either on the full-size drawing or proportionately on a smaller preliminary outline sketch. In Fig. 16 is shown a case where one of the vanishing points *v* is beyond the limits of the drawing board. After determining the distance of the vanishing point, an arc *a b c* is made, with a stick or by means of a string and pencil, on the edge of the drawing paper. A piece of card is then marked with the same curve and cut out as shown at *d*, the cardboard is then placed on the drawing so that the two curves coincide. Two or more pins *e* may be driven into the drawing board along the curved edge of the cardboard. The **T** square is placed along the horizon line, and the cardboard

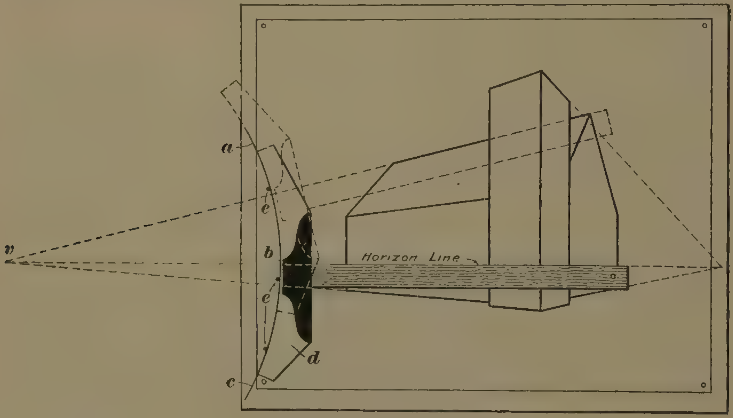


Fig. 16

attached to the head of the square, preferably on the under side, with thumb tacks. The **T** square may then be moved to the position required for any vanishing line converging at the point *v*.

46. Drawing and Proportioning Ellipses.—If an ellipse is to be put around a portrait or building, and the artist resorts to some approximate method that has to be coaxed and favored to perfect the shape, it is purely a waste of time. Art departments are generally equipped with a set of stock ovals made of celluloid or ebonite, which are usually a little large or too small for the particular drawing in progress. Approximate methods for making ellipses are all right for certain kinds of work and for ellipses of certain proportions; but one correct method that can be applied to any proportion of ellipse and that can be easily remembered, is as follows:

Let it be assumed that it is desired to draw a correct form of ellipse $2\frac{3}{4}$ inches wide by $4\frac{1}{2}$ inches high. Draw an indefinite horizontal line *a b*, Fig. 17, and a vertical line *c d* at right angles to it. With the compasses set to one-half of the longest dimension of the required ellipse, $4\frac{1}{2} \div 2 = 2\frac{1}{4}$, with *o* as a center, describe a circle. Again set the compasses to one-half of the shortest dimension of the required ellipse, or $2\frac{3}{4} \div 2 = 1\frac{3}{8}$ and from *o* as a center describe another circle. Now from the point *o*, draw a radial line at random, crossing both concentric circles at *e* and *f*. From the point *e*, draw a line parallel to *a b* and a vertical line from *f* parallel to *c d*; the intersection of these two lines locates a point on the ellipse.

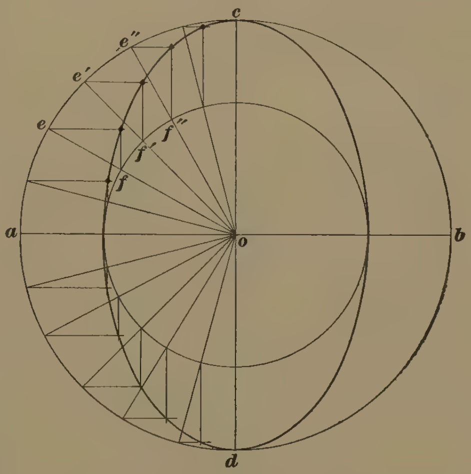
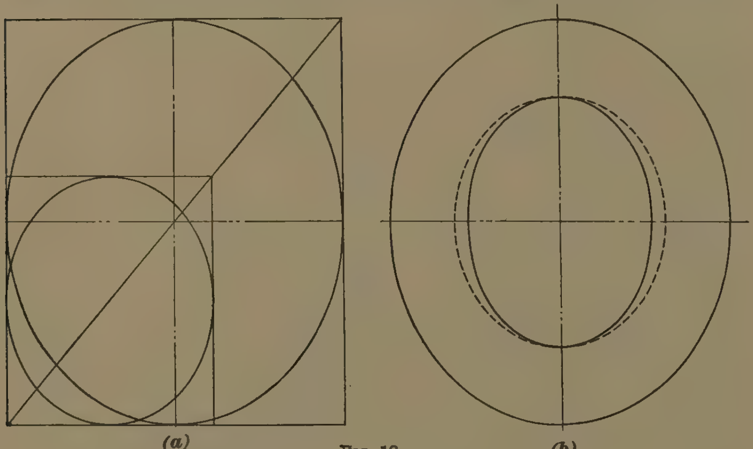


FIG. 17

Any number of points may easily be located by drawing radial lines from o and from points e' and e'' horizontal lines may be drawn and intersected with vertical lines f' and f'', as shown. An irregular curve may now be used to draw a smooth line through the points thus found. Only one-quarter of the ellipse need be constructed and the parts can be repeated by transferring with tracing paper.

The advantage of using this construction over an approximate method is that the exact curves can be determined at each point, so that when reduced it will fit an ellipse of similar proportion. For example, a portrait is to be inserted in an ornamental design, which contains an elliptic opening. A mat is to be cut out and placed over this portrait, and the elliptic opening is to be in the same proportion as that of the ornamental arrangement, so that when it is reduced there will be a perfect fit. The correct method is shown in Fig. 18 (a) and is based on the diagonal method previously described. The wrong method is shown in (b). Here the artist has taken the large-size ellipse from the ornamental arrangement and with a divider has set off equal distances inside to locate points to construct the smaller ellipse. The dotted oval shows the correct form of the smaller ellipse in proportion to the large ellipse.


(a) FIG. 18 (b)

47. For very large sketches, such as billboards and show cards, another correct method of constructing an ellipse may be used to advantage. The ellipse is to measure 2 feet by 3 feet and may be drawn as follows:

Draw the vertical and horizontal center lines *a b* and *c d*, Fig. 19, in the usual manner and lay off from above and below the point *o* along the line *a b*, a distance of 1 foot 6 inches, or one-half the longer axis, locating points *e* and *f*, and from each side of the point *o* along the line *c d*, lay off distances of 1 foot, locating the points *g* and *h*. Now set the compasses to a distance equal to *o f* and from the point *g* describe arcs cutting the line *a b*, thus locating the points *i* and *j*, which are called the *foci* of the ellipse. Drive two pins in these foci and loop a piece of cord around them, as shown. Extend the loop of the cord from *j* to *f*, as shown by dotted lines. Place a pencil inside the loop and when moved around, as shown in the figure, a perfect ellipse will be described.

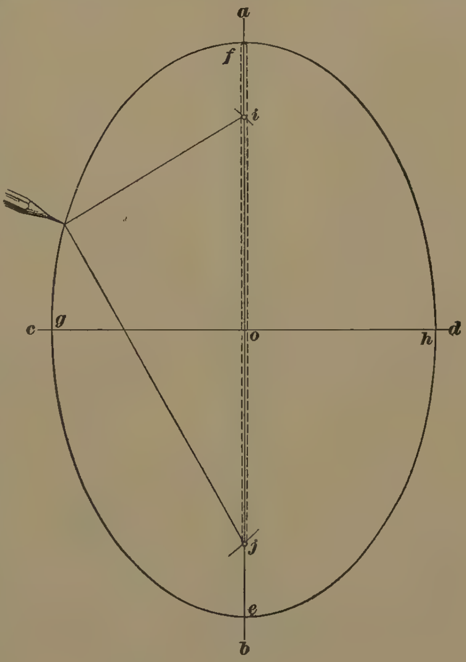


FIG. 19

48. Erasing and Patching.—When an erasure is made, no trace of the lines must show even faintly, otherwise a faulty plate will result. The surface must be carefully handled when erasing, so that when worked on no broken, ragged lines will be produced. If a good grade of bristol board is used, a circular rubber eraser which contains a certain amount of sand is as good as anything. Some artists are skilful in removing a thin shaving from the surface with a sharp knife, the blade of which is held nearly flat. Some remove only the top surface of the ink and finish with a medium hard rubber. If the alteration is extensive and the expense of redrawing is too great, a patch of thin but not transparent paper may be put on. Thick paper will cast a shadow and show in the engraved plate. When an invisible patch must be put on a drawing, the subject is copied on tracing paper, the outlines being carefully followed. This tracing is laid over the paper that is to form the patch and both are cut through with a sharp knife. Ordinary paste, if used to fasten the patch, must not be so thin as to expand the paper and spoil the fit. Several coats of rubber cement are best for this purpose and any superfluous rubber along the edges can be removed without soiling the work.

CLASSIFICATION OF COMMERCIAL ILLUSTRATIONS IN LINE

OUTLINE DRAWINGS

49. Basis of Classification.—One basis of classifying the work of commercial illustrating would be from the standpoint of the purpose for which the drawings are intended; that is, drawings for catalog illustrations, newspaper or magazine advertisement drawings, street-car cards, labels, posters, catalog and booklet covers, etc. These classes of work will be treated, and the method of making such commercial drawings will be discussed, but under a different classification. Inasmuch as the student, while being trained to do commercial illustrating, is being specifically trained to draw for process reproduction in line, the various classes of commercial illustrations in line will be discussed from the standpoint of the pen technique used, whether in outline, in mass, etc.

50. Characteristics of Outline Drawings.—By *line drawings*, in pen-and-ink work for reproduction, are meant those drawings made in pen-and-ink lines on white bristol board or paper. The work may range all the way from a drawing entirely in outline, to one that is very completely shaded.

51. The first kind of drawing prepared for the photoengraving process was the line drawing. This process, as a substitute for wood engraving, soon became very popular, as it furnished a cheaper and quicker method of producing engravings.

Artists at first were trained to make line drawings in close imitation of wood engraving. With the introduction of the half-tone process, however, wood engraving was practically superseded. Wood engravings are still used to some extent and for certain classes of work cannot be excelled. The wood engraving, owing to the lines being cut with a sharp tool, or graver, is easier to print and make electrotypes from than the photoengraved block. The new process had another advantage over wood engraving, as various sizes of blocks were easily produced from the same original drawing by photography.

When a wood engraving is made from a drawing, the result depends on the skill of the wood engraver, while the photoengraved block is a mechanical product, hence, artists and publishers willingly patronized a process that could reproduce a drawing in facsimile cheaply and in a limited time. The line drawing held the entire field until the halftone process was invented, by which an engraving may be made directly from a photograph, a wash drawing, or the object itself.

The advantages of the line drawing over the halftone are: ease and cheapness of reproduction; less difficulty in printing from the plate, which requires very little make ready, is easily electrotyped and stereotyped, and may be printed on a cheap grade of paper.

One of the most important things about the line-engraving process is that the most minute detail can be brought out clearly, if properly rendered by the artist in the original drawing. For technical subjects, where detail is very essential, the line drawing is superior to the halftone.

52. Requirements of Line Drawings for Reproduction.—To produce a good printing plate, the lines on a drawing should be spaced neither so wide as to appear too coarse and open, nor so fine as to fill in, when reduced. At first, a person should make his drawings double the size of the required plates, and so become accustomed to that scale of the technique, which is the one most commonly used.

Lines thicken slightly in reduction and gain a little more when the plate is printed, so that the spaces between diminish; hence, lines should be made clean, distinct, and with sufficient space between them to allow for reduction.

53. When making tints, relative values are to be kept distinct in color, as the lighter tones tend to darken in printing, and the black tones remain unchanged. A dark tint should not be rendered by placing fine lines close together, but by fewer and heavier lines placed far enough apart to reduce properly. Shadows so treated print clean and appear transparent, because of the amount of light exposed between the lines.

The amount of white paper in the form of a high light or between the lines is just as important in getting the effect as the rendering. A drawing may be reproduced, and the engraver's proof be all that could be desired; but if the artist has not taken into consideration the kind of paper on which it is to be printed, the result may be poor. The kind of paper on which a plate is printed determines the quality, character, method, or style, and scale of the technique. If the drawings for reproduction are to be printed on a poor grade of paper, economy of line and directness of method are the main things to consider.

When rendering a drawing for a large reduction of most subjects, the details may be simplified or suggested so that the general effect is retained in the reduction and a better printing plate is produced.

54. When preparing an outline drawing the artist should realize that a great deal can be expressed in a simple outline, which may be made of varying thicknesses, and so delicately graded as to suggest either form or texture. Each line should contribute to the final result and at the same time have a finished appearance as a whole. The lines should not be of a wiry character, which express neither feeling nor individuality. A careful study of the pencil outline should be made before inking; in fact, the pencil drawing should have the appearance of the finished drawing. This apparent waste of time is in reality a saving, because the inking can be more speedily done and the result is more certain if the pencil outline has the proper character.

55. Silver-Print Drawings.—A very serviceable and convenient type of drawing in outline made for line engraving

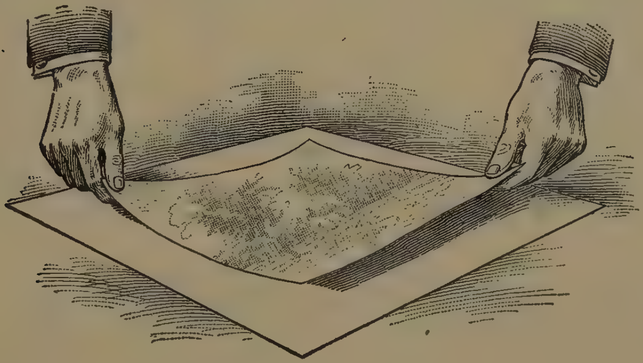


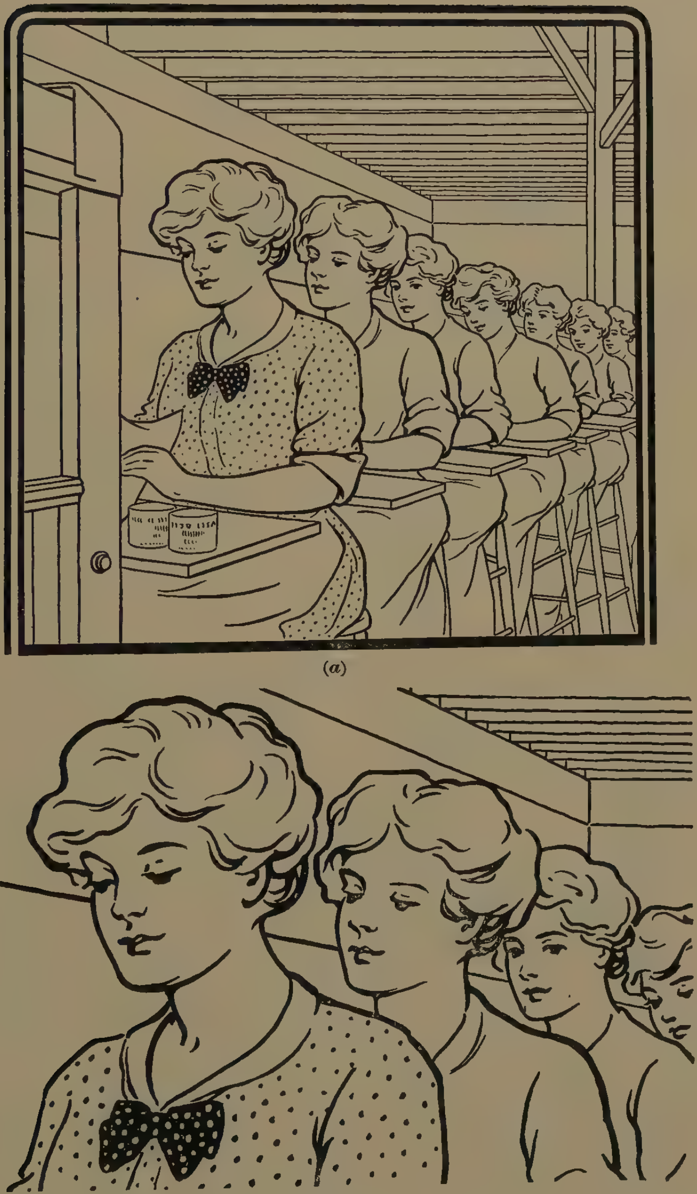
FIG. 20

is the silver-print drawing. A **silver print**, or *bleachout print*, is a photo print made on a dull-surface paper and worked upon by the artist. The material furnished may be a photograph or a mechanical device, and to save the artist time in sketching it to a desired scale, a negative is made of the proper size and a print produced on a dull, unglazed, silvered, photographic paper, which the artist mounts and then makes the pen-and-ink rendering directly over the photograph. After the main outlines are inked and parts that are indefinite or that require alteration are penciled in, the print is bleached by pouring over the surface of the drawing a saturated solution of bichloride of mercury, dissolved in alcohol. The surface of the photo print after bleaching becomes white and should be rinsed off with water to remove any particles of mercury and to keep it off the hands, as it is a poison. The ink lines will not be disturbed by the bleaching, if waterproof ink has been used. The print should now be thoroughly dried, but not in the sun, as the print will become yellow and the image will return faintly. This returned image can be removed, however, by bleaching it over again. These prints may be obtained from photoengravers or from firms who specialize in photographic prints.

56. When mounting a silver print, sufficient paste should be used to hold it securely to the cardboard, so that it will not be loosened in bleaching. The best plan is to wet a silver print before mounting, as the paste is more easily applied and the ends will not curl up and soil the face of the print with paste. The print should be held as shown in Fig. 20 and then placed on the cardboard. A piece of wrapping paper is now laid over the print and smoothed by gradual rubbing from the center toward the outer edges. All blisters and consequent wrinkles in the paper, which would necessitate remounting, are thus avoided.

57. Typical Examples of Outline Drawings.—An advertisement illustration, such as that shown in Fig. 21 (*a*), is made in outline style, and is therefore suitable for printing on a cheap grade of paper, all superfluous lines being omitted and the effect brought out by varying the thicknesses of the lines.

The illustration was intended to show that the article advertised was made in a clean and well-managed factory and that the employes were well treated and contented. To produce the proper pictorial effect, the artist carefully graded the thicknesses of the lines; for example, the figure in the immediate foreground has been boldly outlined and the other figures as they recede in the picture have finer outlines, which assists the perspective effect. To further emphasize the foreground, the clothing of the first figure has been stippled and a darker tone was added in the bow tie. A double border line around the picture strengthens the advertisement and contributes



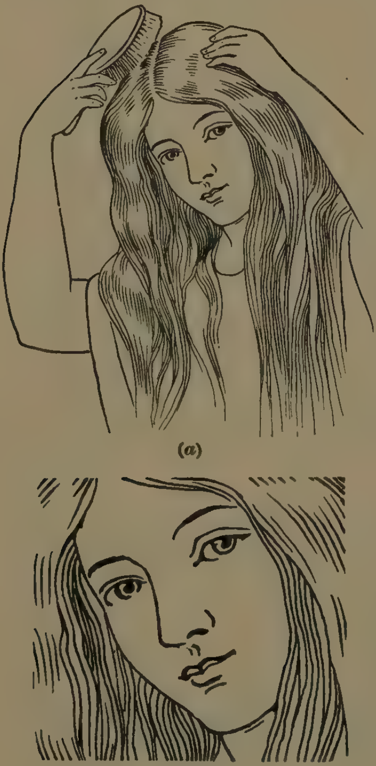
(*a*)

(*b*)

Fig. 21

to the general effect. The thickness of the lines as they would appear on the drawing is shown in (*b*), assuming that it has been made double the size of view (*a*).

58. In Fig. 22 (*a*) the same effect has been obtained by using firm outlines practically uniform in thickness, and the gray mass produced by the lines in the hair has added the desired strength to the picture. The lines suggesting the eyebrows and eyes have been made a trifle bolder and the drawing as a whole has a finished appearance. The enlarged detail shown in (*b*) is the full size of the original drawing and may be referred to when preparing such an illustration.


(*a*)
(*b*)
Fig. 22

An illustration of this kind may be prepared from an idealized photograph, or verbal instructions may be given the artist, who may procure his data from other illustrations, or may sketch from a model. If the matter is left to his judgment, the artist makes a rough sketch suggesting the advertising features, from which, if approved, a drawing is prepared to a larger scale.

59. A new feature in advertising the same article is shown in Fig. 23, namely, that the article is of fine quality and therefore suitable for the toilet, bath, and nursery. Although the lettering is prominent in comparison, the illustration shows well and tells the story. Heavy outlines are employed for the main contour, finer lines for the smaller details, and little touches to accentuate certain parts. These points can be better studied by reference to Fig. 24. The hair has not been heavily outlined, as a sufficient number of lines forming a gray tint have been used to get the effect. Sufficient high lights have been left in the hair, so that the effect as a whole is in harmony with the rest of the drawing.

The drawing of a subject of this kind is best made three times larger than the illustration required. The extra space will allow freedom in rendering and opportunity to work out the details properly. Fig. 24 shows the strength of line as it appeared on the original drawing. The lettering has been drawn as a suitable style of condensed type that would fit the space and be sufficiently prominent is difficult to find.

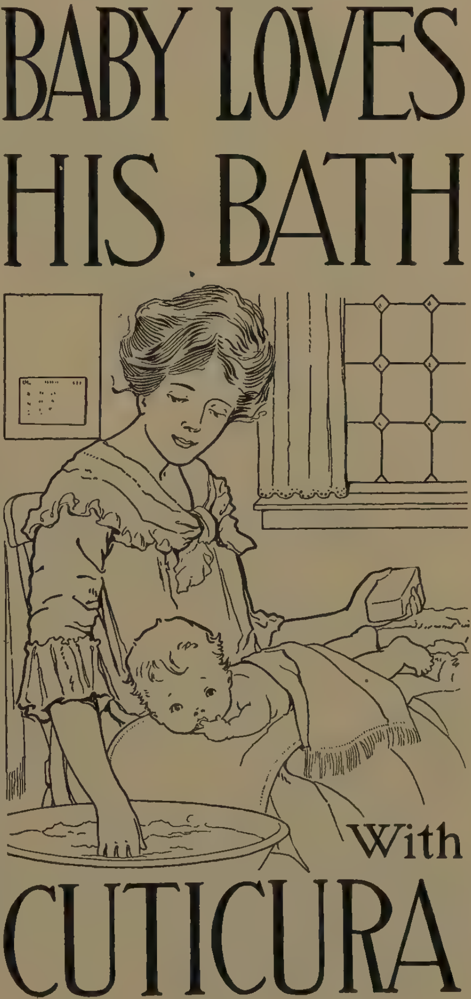


FIG. 23

60. Cartoons or drawings of a pictorially graphic style, may be treated in a variety of ways; but if an outline style of rendering is adopted, the main outlines should be made strong, and touches of black carefully placed to indicate shadows add strength. Reference to Fig. 25 (*a*) and to the full size detail in view (*b*), which is the scale to which the drawing was made, will give a better understanding of this principle. This example shows how a face treated with few lines may furnish good copy for the engraver. The line shading at the lower part in (*a*) connects the composition and gives variety.

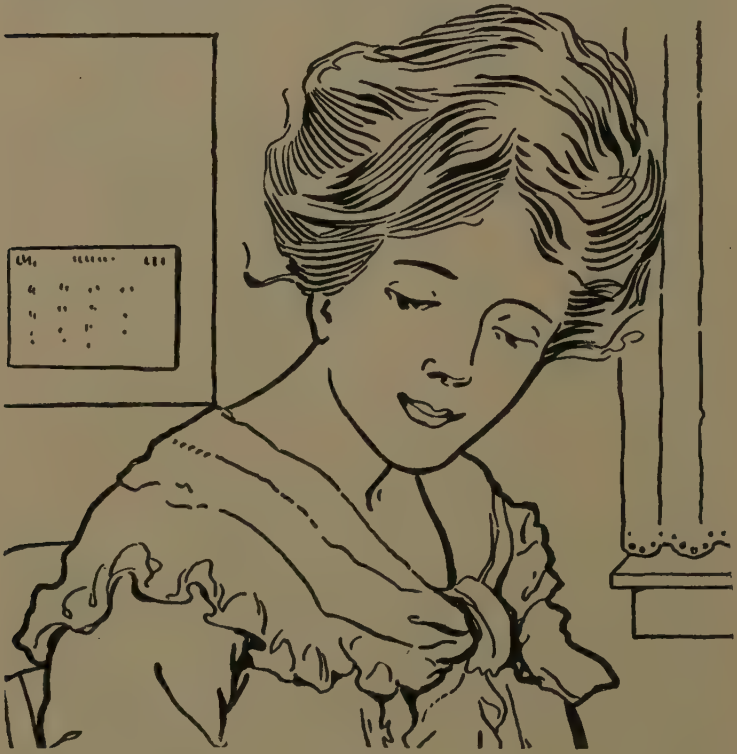
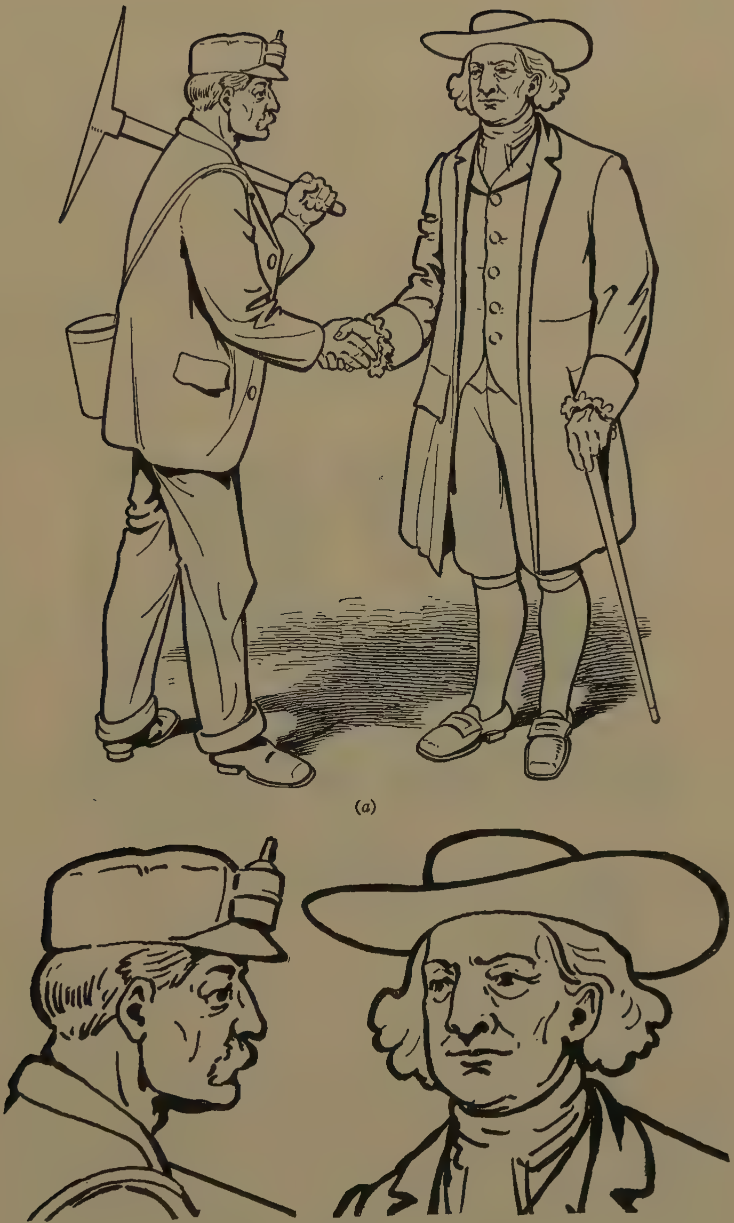


FIG. 24



(a)

(b)

Fig. 25

SOLID-MASS-SHADED DRAWINGS

61. Characteristics and Treatment.—Illustrations treated in outline style are usually too light-colored to be effective, particularly in newspapers, when surrounded by other advertisements containing considerable black. A newspaper-advertisement illustration should be rendered with an idea of dominating a whole page, though only a small space is occupied, by such prominent display that every hurrying eye will notice it.

The haste with which the public read and discard newspapers demands a bold and striking treatment. Details and delicate shadings are sacrificed to one big central idea, easily seen and easily understood. A style of rendering covering these specifications is shown in Figs. 26 to 32, inclusive; the shading of which is done in solid black masses.

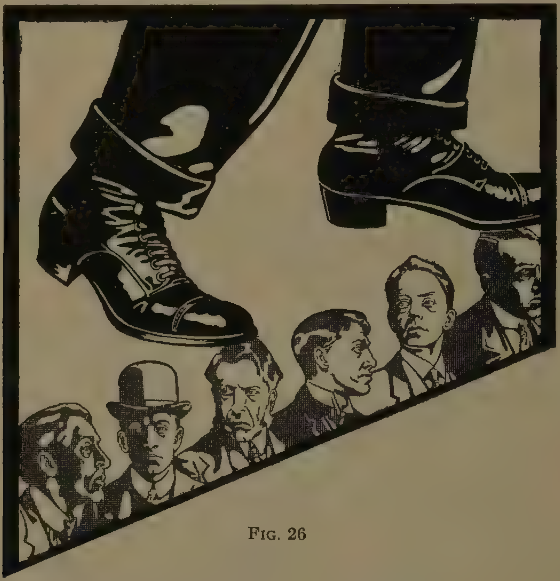


Fig. 26

When drawings are rendered in this style, small details should be omitted or simplified, and only the main lines used to preserve the character of the subject. The shadows that produce the effect must be carefully outlined and tinted over in pencil, so that the general effect may be observed before inking. In some instances the shadows may be so well placed that the form is suggested and portions of the outline may be omitted to advantage.

62. Typical Examples.—The method just given is used in both magazines and newspapers. In magazines, however, the technique may be varied and other textures added on account of the superior quality of paper used in printing. In Fig. 26 is shown an example of a mass-shaded subject, a portion of which has been altered to a gray tone by the engraver, though the original drawing was prepared in solid black. The method used by the engraver to get the gray effect will be described in connection with the halftone engraving.

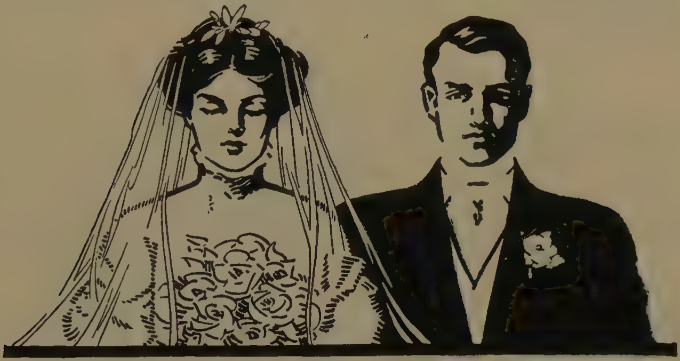


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FIG. 27

63. In Fig. 27 is shown another example of mass shading and one that may be studied to advantage. The outlines have been omitted in part and the figure to the left, while treated light in color except the head, is in perfect harmony and balance with the heavily shaded figure on the right. The manner of rendering the veil of the bride by a few simple lines and the transparent effect obtained by using short lines of shading on all those parts that occur behind the veil, is a good method to adopt in a case of this kind. This style of drawing may be made three or four times larger than the illustration shown, depending altogether on the manner in which the artist works or the standard adopted by the art department.

64. Mechanical subjects are difficult to render so as to produce an interesting picture. The illustration of an ink bottle shown in Fig. 28 is an example that was simple to treat in this manner, as the form was suggested by the outline itself and the nature of the subject demanded a solid black with brilliant high lights. The illustration is rendered so that when reproduced it will print on a hard-finished bond paper, which is a poor surface on which to print either a line-shaded drawing or a halftone plate. A tracing was made from a photograph, which was one-half larger than the illustration. The main outlines and the lettering were inked and the areas of the black mass shading carefully penciled until the desired effect was obtained, when these parts were also inked. The radiating lines on the stopper were put in by placing a pin at the point where the two outside lines converge and then using the pin as a guide for ruling the lines.

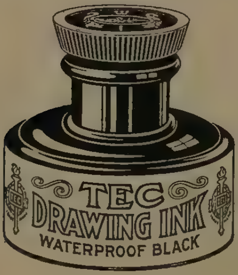


Fig. 28

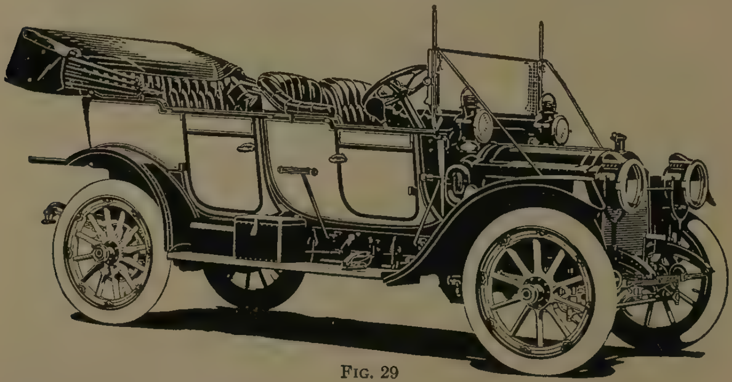


Fig. 29

The Packard No. 38 Phaeton

65. The automobile shown in Fig. 29 is more difficult to treat in this style on account of the great amount of detail which is to be massed. The whole has been made to appear as if it were strongly illuminated. The illustration shown has been made over a silver-print. It is a fine example of this style of treating a complicated mechanical subject. Such a drawing may be made three times larger than the illustration shown. The white lines that separate the black masses are best left white and white ink should be avoided. Brilliant high lights and definite cast shadows produce a more interesting mechanical illustration in a shorter time than if the natural gradations of the photograph were imitated to get the effect.

In Fig. 30 is shown another drawing for a page-head cut treated in this style. The heavy black masses have been confined to the clothing and the character of each face has been very cleverly suggested by small black shadows.

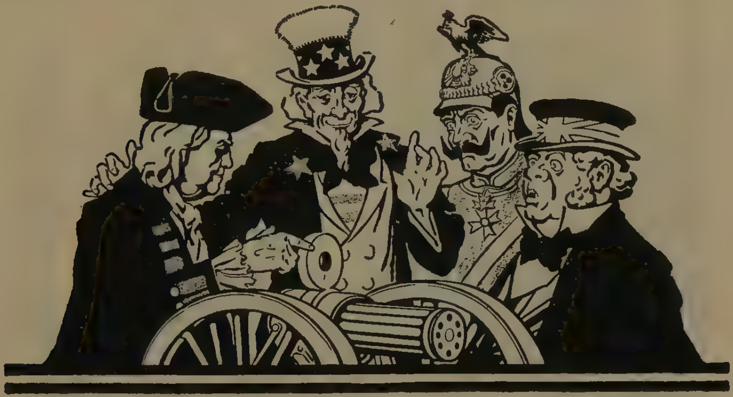


Fig. 30

By Permission of the Curtis Publishing Co.

When preparing such an illustration, small sketches may be made of each head on separate pieces of paper and used for reference, when the general composition has been determined, in preparing the large drawing. The costume or other details of the picture should be correct, even though only suggested in the design.

66. A publisher's advertising poster, rendered in a similar style, is shown in Fig. 31. Here the style has been somewhat modified, the black masses being softened by using short lines around the edges. The technique used on the books is also interesting and the illustration for study is valuable. On the large poster for which this original drawing was prepared, a

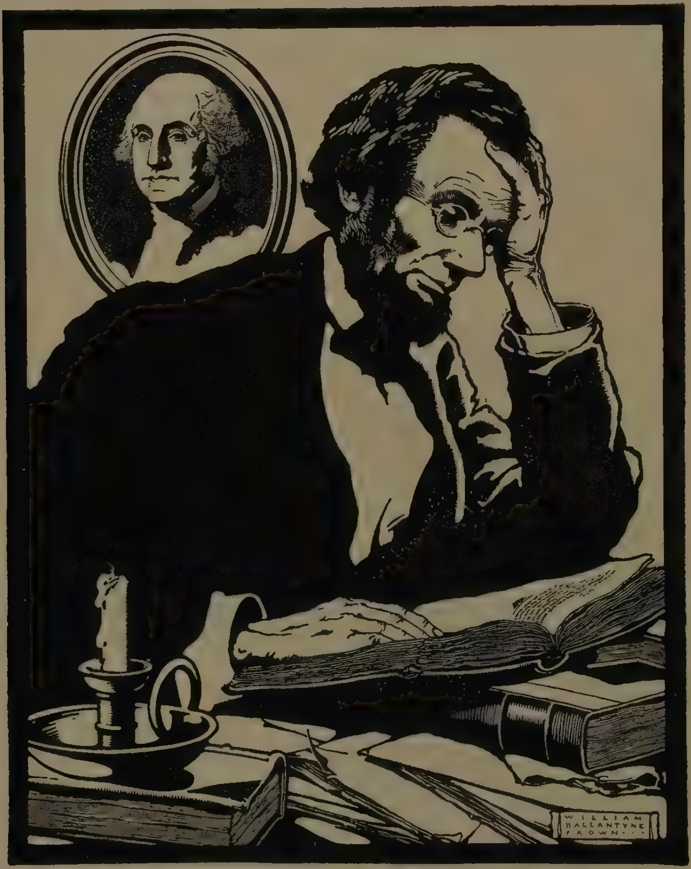


FIG. 31

By courtesy of "The Youth's Companion."

color block, used as a background behind the figure, brought out the high lights and softened the harsh black masses. The white stippling used to break up somewhat the large areas of black, while interesting, has been of no special value.

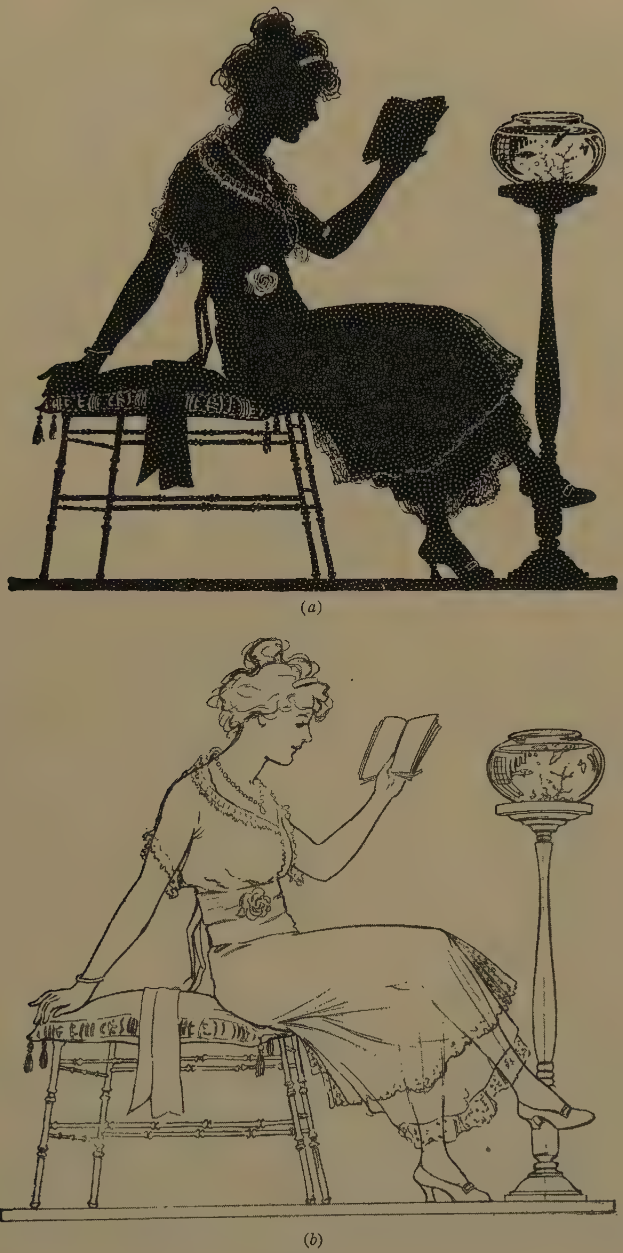


Fig. 32

67. White Stipple to Relieve Solid Blacks.—If a subject has an interesting outline, its treatment in silhouette style may be very effective, as shown in Fig. 32 (*a*). Many high-class magazines object to the use of too much solid black in illustrations and overcome it with a line or stippled tint over the solid black masses. The proper foundation for such a white stippled silhouette is a very careful pencil drawing, fully modeled, as shown in Fig. 32 (*b*). Some stippled effects used to reduce the intense black are put on the negative or plate, with a shading machine, details of which will be described later.

PART-SHADED LINE DRAWINGS

68. Characteristics and Treatment.—In Fig. 33 (*a*) is shown a yachtsman, which may be considered in the part shaded line class and a little more complex, as the effect is to be obtained with a limited amount of shading, the lines of which are to be made a certain thickness, while sufficient space is to be left between them to allow for the reduction.

The carefully drawn pencil sketch conveyed practically the effect of the finished drawing before inking. The sketch was drawn by a man experienced in drawing figures, who required neither model nor data. After the pencil sketch was completed, the drawing was carefully inked for one-half reduction, and the shading furnished sufficient strength to the drawing on the dark side. The outline on the light side was strengthened, thus producing a more vigorous drawing. The lines suggesting the water, as well as those which extend to the outer edges of the drawing, have been cross-lined by tooling to produce blended edges in printing.

The detail in (*b*) shows how a face may be treated with few lines and while producing all that is desired as a picture, may at the same time be most suitable for reproduction.

69. The illustration shown in Fig. 34 (*a*) was made for a standard column newspaper advertisement. The drawing has been treated in a heavier and blacker style than those previously described, which is desirable when the cut is to be surrounded in a paper by other dark-colored advertisements. This drawing was also carefully planned in pencil, so that the effect could be obtained without employing too many lines. The drawing is rendered very bold, both in outline and color, and the heavily shaded parts are blended into white by using tapering lines. The outline of the figure on the side that receives the light has also been made of varying thicknesses, so as to avoid a mechanical appearance. The drawing, a detail of which is shown in (*b*), was made double the size of the illustration in (*a*). The engraver was instructed to reduce the drawing to exactly $2\frac{1}{6}$ inches wide and to plane the block close to the work on the two vertical sides; therefore all nails used in mounting the plate on the wooden block were located inside this dimension. The

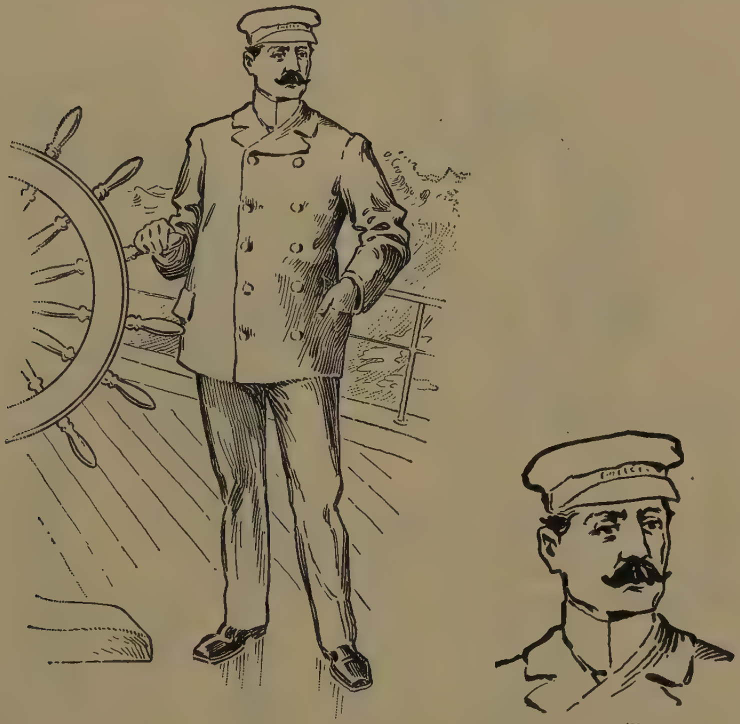
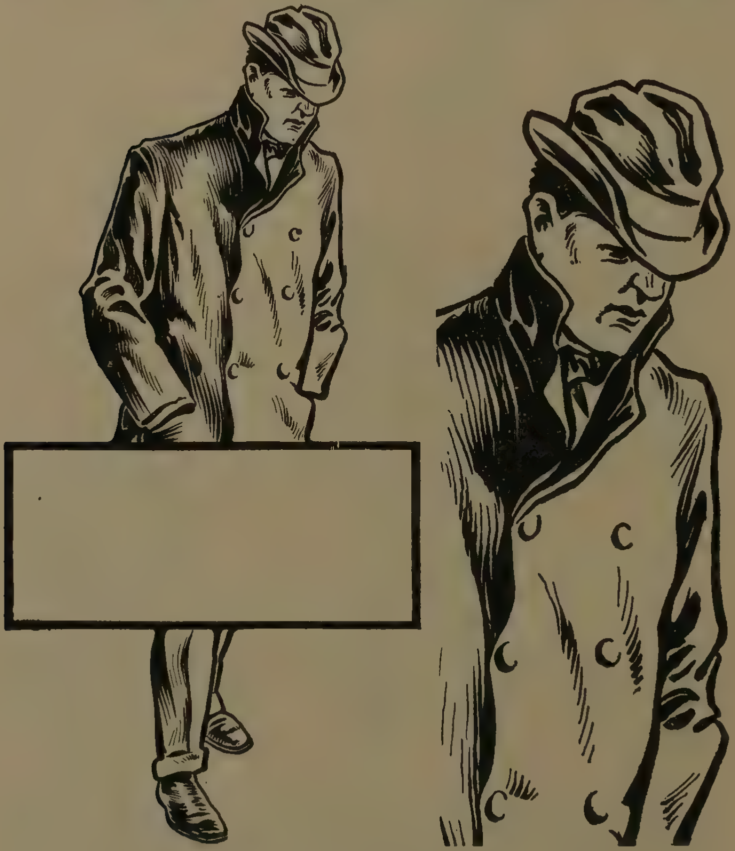

(*a*) (*b*)

FIG. 33

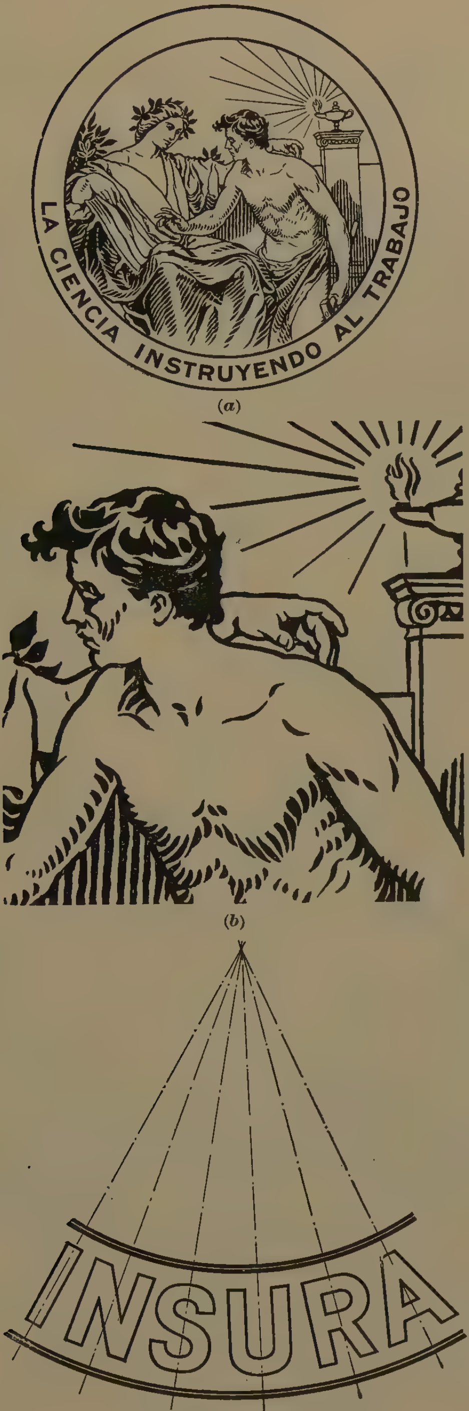
rectangular space was cut out on the plate to allow type to be inserted. The word *mortise* is used when giving instructions to engravers for cutting out such spaces.

The part-shaded type of drawing is somewhat difficult to render, as the effect is to be obtained by using a style of technique suggesting the surface or material, and with a limited number of lines of the proper weight to produce a certain tint value, and spaced to allow for the reduction.



(*a*) (*b*)

Fig. 34


LA CIENCIA INSTRUYENDO AL TRABAJO
INSURA

(a)

(b)

(c)

Fig. 35

70. The illustration of the seal shown in Fig. 35 (*a*) is treated in part shade, and the enlarged portion, view (*b*), shows how details may be boldly treated and simplified when preparing a drawing for a large reduction. The drawing was made $7\frac{1}{4}$ inches in diameter and reduced to 2 inches. The lettering was carefully sketched out in pencil, so that the first and last letters came in line. When drawing lettering around a circle, it should be laid out on tracing paper, so that if the first and last letters do not come out in an even line the tracing paper may be moved around in correct position, thus avoiding the necessity of resketching. All lettering, when planned to go in a circle, should be made so that a radial line passes through the center of each letter, and the sides of all straight-line letters should be made parallel to the center lines, as shown in (*c*).

FULL-SHADED LINE DRAWINGS

71. Flesh Texture, Etc., for a Cover Design.—Fig. 36 is here introduced, as a high-grade specimen of full-shaded line work to serve as a contrast to the part-shaded line drawing of the same subject used in Fig. 35. A comparison of the two will show just how the completely rendered drawing of Fig. 36 must be simplified for such small-reduction work as in Fig. 35. The original design and drawing in Fig. 36, entitled "Science Instructing Industry," was made by Kenyon Cox for use on a magazine cover page. The technique has been varied according to the surface to be treated and the coarseness and fineness of the tinting used to produce the perspective effect has been carefully studied. The high lights are well defined, and the shading used for the flesh tints made transparent in quality. These lines, if run in a wrong direction, are likely to give the figures a wooden appearance. Undue prominence of the lines of the gray background, radiating from the lamp, is avoided by making the lines of a smoother character, which brings out the high lights on the figures. As these lines approach the lamp, their number has been gradually reduced, to avoid a dark and muddy tint and the closing in of the lines, and to maintain a tint even in color. The outlines of the figures have been made

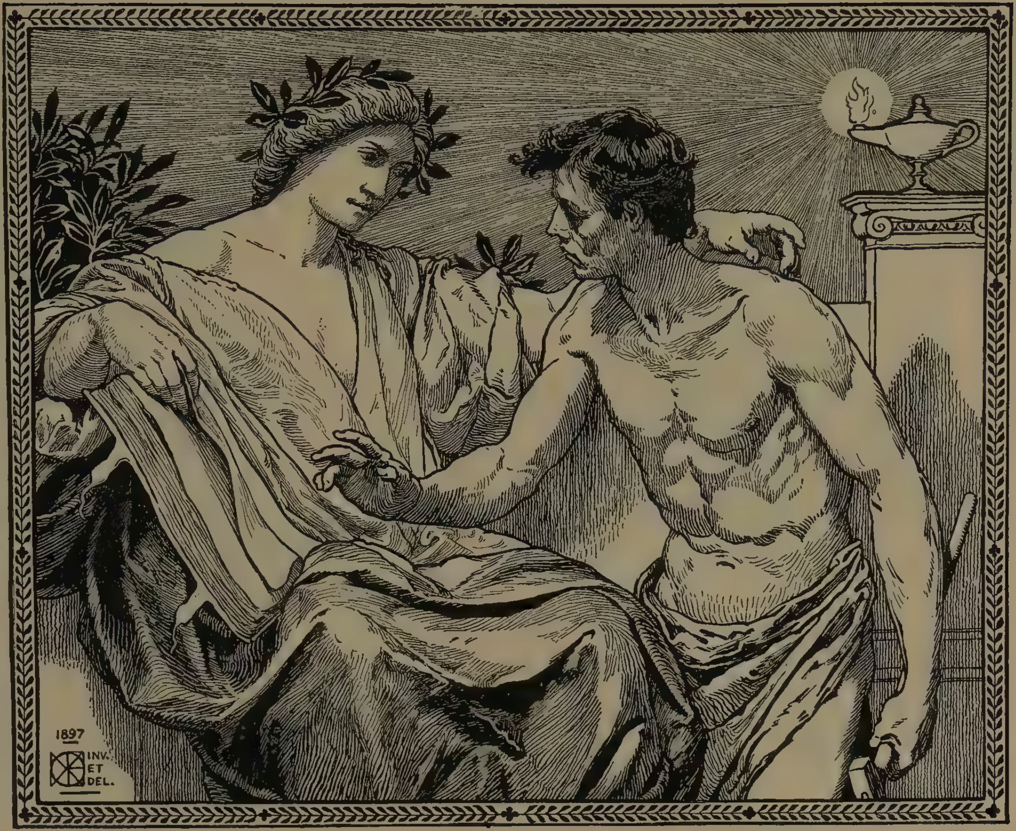


FIG. 36

heavier in parts to separate them from the various tints, thereby producing a more vigorous drawing. The technique used for the drapery is also well worth studying. The enlarged detail in Fig. 37 gives the scale of the technique employed on the original drawing.

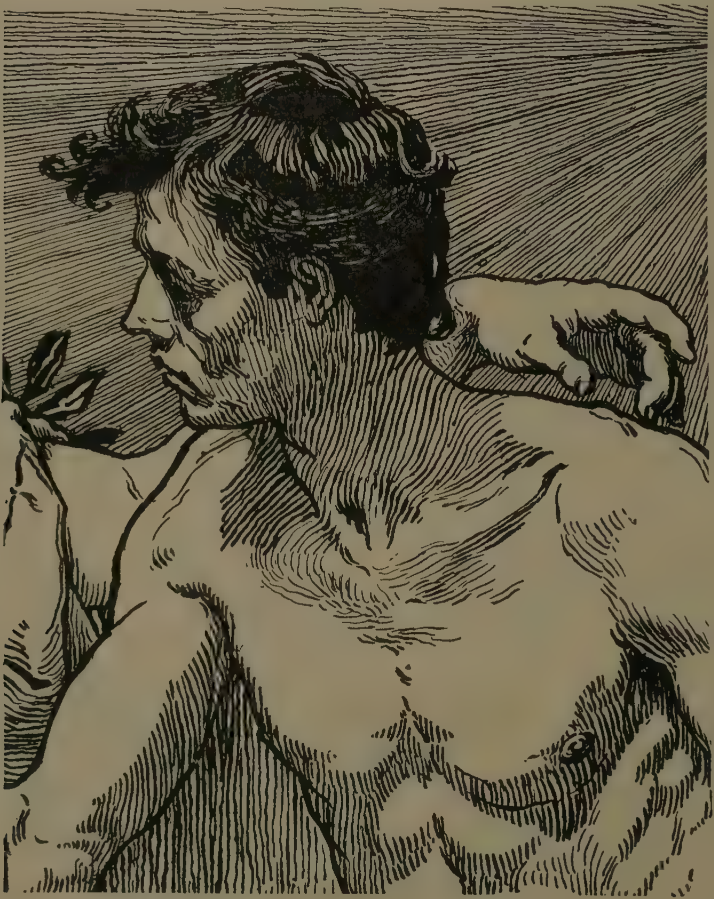


FIG. 37

72. Drawings of this character are carefully planned, and the figures sketched from life, and the masses of shade put in with pencil, after which the artist need only be concerned with style, direction, and spacing of the lines to suit the reduction.

73. Skilful artists need not carry the finish of a pencil sketch as far in detail as a beginner; but nevertheless an illustration to be rendered in ink and in a style suitable for reproduction, should be carefully planned in pencil. When details are merely to be suggested, the pencil sketch should be well drawn so that all shadows are carefully defined, with the result that the attention is given to the inking alone which becomes a simple matter.

The examples shown in Figs. 36 and 37 are sufficient to illustrate typical specimens of full-shaded line drawings for commercial illustrations to be reproduced by the line-engraving process. As the student proceeds with the next Section devoted to special commercial line techniques, further examples of full-shaded line drawings will be illustrated and discussed, in connection with special techniques and methods of working as used in commercial studios and drafting rooms.

DRAWING EXERCISES FOR LINE ENGRAVING

GENERAL INFORMATION

74. Required Work.—As a test of his comprehension of the material and as practice in technique and design, the student will be asked to prepare drawings in accordance with specific directions and to submit them to the Schools for criticism and advice.

These drawings will be of three general kinds: Pen-and-ink drawings in line and mass to be copied from certain text illustrations as specified, which text illustrations have been arranged for the express purpose of teaching art-department or drafting-room technique; original renderings from photographs or actual objects and scenes, in which the general technique is used as employed in the first kind of work; original composition illustrations for advertising or mercantile purposes in which the requirements of both business and commercial-art technique are observed.

75. Character of Plates.—As in the case of previous subjects, these drawings will be arranged in the form of drawing plates. While the drawings are to be made in pen-and-ink, the student will not be restricted to the use of any special paper. Linen ledger, or any similar bond paper coming in sheets 16 inches by 21 inches, is recommended. Each sheet should be cut in half, thus making two plates, each 10½ by 16 inches. This paper has a smooth, hard surface, very suitable for pen-and-ink work, and is sufficiently flexible to be rolled and mailed in a tube. Bristol board and illustrators' board are much used by professional workers, but if used by the student must be mailed flat. The student may doubtless have on hand, left from his work in previous subjects, sufficient paper to proceed with this work; if not he should purchase a supply at once.

Before beginning work on any drawing plate, the conditions and requirements must be carefully observed, that the drawing may be of proper size, proportion, etc. Reference should always first be made to the portion of the text where the preparation of the kind of drawing in question is fully discussed and illustrated.

PLATE 1

76. Exercise A, Plate 1.—Within the upper half of the 10½″×16″ plate arranged vertically, that is, within a space 10½ inches wide by 8 inches high, lay out a diagram showing how to estimate the proportions and size of a drawing that is to be twice the size of the printed engraving or cut. Assume that the finished cut is to be 4 inches wide by 3 inches high, and use the method of projected diagonal, as shown in Fig. 11.

77. Exercise B, Plate 1.—Within the lower half of the plate, lay out pictorial diagrams showing how the leading lines of a small sketch may be enlarged proportionately to fit within a larger rectangle, using the system of horizontal cross-lines after the method shown in Fig. 12. Assume the small sketch or drawing to be 3 inches wide by 3 inches high, and divided into 12 squares each way (144 squares in all). Enlarge this small sketch so that it is to fit into a square 5 inches wide by 5 inches high. Use the method of tilted scale rule and diagonal, and after completing the cross-lines and enlarged sketch, draw lightly on the larger sketch, the position of the scale rule as it was placed when marking off the points for the horizontal lines.

78. Final Work on Plate 1.—When completed, write or letter on the back of the sheet the title, Plate 1: Drawing for Line Engraving (Part 1), class letters, and number, name and address, etc., and lay the plate aside until Plate 2 is completed; at which time Plates 1 and 2 may be mailed to the Schools at the same time for examination. Proceed then with Plate 2.

PLATE 2

79. Exercise A, Plate 2.—Within the left-hand half of the upper half of the plate arranged vertically; that is, within a space $5\frac{1}{4}$ inches wide by 8 inches high, lay out an ellipse geometrically, according to the method shown in Fig. 17. A compass sufficiently accurate for this work can be obtained at any stationery store for from 5 to 25 cents, though it will be to the student's advantage to possess an accurate set of drawing instruments. This ellipse may be constructed on the dimensions given in the text, $2\frac{3}{4}$ inches wide by $4\frac{1}{2}$ inches high, or on any other selected dimensions that will fit well within the prescribed rectangle.

80. Exercise B, Plate 2.—Within the right-hand half of the upper half of the plate, lay out an ellipse by the method shown in Fig. 19, using the pencil, string, and stationary pins. The same dimensions may be used as given for Fig. 19, if inches are substituted for feet as there specified, or the ellipse may be made the same size as the one for Exercise A of this plate, or even larger.

81. Exercise C, Plate 2.—Within the lower half of the plate draw a diagram showing how an enlarged ellipse may be laid out so that, when reduced to a specified size (say to serve as a border for a half-tone cut) it will be in exact proportion. Proceed as shown in Fig. 18 (*a*). Assuming that the final cut, that is the elliptic shape of the halftone, is 4 inches high, make the larger ellipse (to represent the drawing) about 7½ or 8 inches high by the methods of ellipse drafting and enlargement previously described. Follow method shown in Fig. 18 (*a*), and avoid method shown in (*b*).

82. Final Work on Plate 2.—Write or letter on the back of the sheet the title, Plate 2: Drawing for Line Engraving (Part 1), class letters and number, name and address, etc., place Plates 1 and 2 in the mailing tube and send to the Schools for examination. Proceed then with Plate 3.

PLATE 3

83. Exercises A, B, C, and D, Plate 3.—Within the upper half of the plate arranged vertically, lay out four squares each 2 inches on a side (or four rectangles each 3 inches wide by 2 inches high), separated by 1-inch spaces, and letter them A, B, C, and D, respectively. In rectangle A, draw vertical lines in black ink and, after they are dry, soften off part of them by white-ink lines drawn horizontally, after the method shown in Fig. 8 (*a*). In rectangle B, draw vertical black lines crossed by horizontal white lines to give a soft gray value, after the method shown in Fig. 8 (*b*). In rectangle C cover the entire ground with a wash of perfectly black ink, and allow to dry thoroughly. Then with white pigment or ink, applied with the point of the pen, cover part of the black surface with white dots, after the method shown in Fig. 9 (*a*). In rectangle D, cover the background with carefully drawn diagonal lines and surround it with an outline. Then, with white ink, draw a white line around the inside of the black outline, thus separating the tone or tint of the field from the black outline, after the method shown in Fig. 9 (*b*).

84. Exercise E, Plate 3.—Within the left-hand half of the lower half of the plate, that is, within a space 5½ inches wide by 8 inches high, make an exact copy of the outline drawing of the girls shown in Fig. 21 (*b*), making the scale exactly the same, and the lines of the same weight. If desired to fill the rectangle, allowing of course a ¼-inch white margin, more of the picture, as shown in (*a*), may be drawn, but the scale shown in (*b*) should be adhered to.

85. Exercise F, Plate 3.—Within the right-hand half of the lower half of the plate, prepare an original pen-and-ink drawing, from a photograph or from an actual group, and render it in the simplified outline method used for Exercise E. Whatever picture is drawn, first make a careful pencil drawing with sufficient shading to show modeling of flesh, costumes, etc., but simplify the pen drawing made over this pencil drawing to resemble the outline method used for Exercise E. Then erase the pencil work.

86. Final Work on Plate 3.—Write or letter on the back of the sheet the title, Plate 3: Drawing for Line Engraving (Part 1), class letters and number, name and address, etc., place the plate in a mailing tube and send it to the Schools for examination. If any redrawn work has been required on previous plates, attend to it at this time; after which take up the work on Plate 4.

PLATE 4

87. Exercise A, Plate 4.—In the upper, left-hand, 5½″×8″ rectangle of the plate arranged vertically, make an exact copy of the outline drawing shown in Fig. 24, making the lines exactly the same weight. If desired to more nearly fill the rectangle, draw more of the picture, as shown in Fig. 23; but maintain the scale of Fig. 24.

88. Exercise B, Plate 4.—In the upper right-hand, 5½″ × 8″ rectangle of the plate, make an original pen-and-ink drawing of a girl's head, a man's head, or of a child, from a photograph or direct from life. First draw it carefully and fully modelled in pencil, and then render it in accented pen outline, after the method shown in Fig. 24. Then erase the pencil work.

89. **Exercise C, Plate 4.**—In the lower left-hand, 5½″×8″ rectangle of the plate, make a copy of the half-silhouette picture of the man on the right in Fig. 27. Enlarge this portion (showing the man) either freehand or by means of the system of squares, to two or three times the size of the cut in Fig. 27, so as to more nearly fill the prescribed rectangle. Observe the greatest care in drawing the outlines of the black-shaded masses and filling them in.

90. **Exercise D, Plate 4.**—In the lower, right-hand, 5½″×8″ rectangle of the plate, make an original pen-and-ink drawing in the half-silhouette style used for Exercise C. Draw the head and shoulders of a man from a photograph or from life, and carefully model it in pencil. Then render it in pen and ink after the method used in Exercise C. Erase all pencil work.

91. **Final Work on Plate 4.**—Write or letter on the back of the sheet the title, Plate 4: Drawing for Line Engraving (Part 1), class letters and number, name and address, etc., place the plate in a mailing tube, and send it to the Schools for examination. If any redrawn work has been required on previous plates attend to it at this time; after which take up the work on Plate 5.

PLATE 5

92. **Original Design for an Advertisement Drawing.** Make an original advertisement illustration for a two-column line cut for an advertisement of Snow-White Washing Powder. The lettering may, or may not, be shown on the drawing, as preferred. Among the subjects suggested are a woman, cleanly and crisply gowned, washing clothes at a tub or wringer, the clothes showing as being pure white; a scene showing a stretch of snow-covered fields, with an outlined cake of soap at top or bottom of picture, etc.

A column width is 13 ems, that is, 2⅙ inches; therefore, two columns will be 4⅓ inches wide. The cut must be slightly less, say 4 inches, or 4⅛ inches, the height may be 5 or 6 inches.

The original drawing should be laid out at least twice the size of these dimensions.

The proper technique of rendering must be decided on by the student, although that of Fig. 21 or Fig. 24, is suggested. When completed, the drawing (which will be at least 8 in.×12 in. and will occupy the greater part of the $10\frac{1}{2}''\times 16''$ sheet) should be marked "Reduce $\frac{1}{2}$," if that is the proper reduction.

93. Final Work on Plate 5.—Write or letter on the back of the sheet the title, Plate 5: Drawing for Line Engraving (Part 1), class letters and number, name and address, etc., place the plate in a mailing tube, and send it to the Schools for examination.

If any redrawn work on any of the plates of this Section has been called for and has not yet been completed, it should be satisfactorily finished at this time. After all required work on the plates of this Section has been completed, take up the work of the next Section, which is a continuation of the training in commercial illustrating.

DRAWING FOR LINE ENGRAVING

(PART 2)

TECHNIQUES FOR VARIOUS TEXTURES

POULTRY

1. Importance of Special Technique.—Although in his study of pen-and-ink rendering the student has already received artistic training in line technique for definite textures, this training must be supplemented by a training in those methods used in commercial art departments and drafting rooms that experience has shown to be the best for portraying certain textures and objects.

The artistic, sketchy technique suitable for a magazine or book illustration is not always suitable for a catalog illustration or an advertisement picture. For instance, while a mere sketchy artistic outline picture of a fowl may serve as an accessory to a fiction illustration, it probably will not do at all as an illustration of a particular type of bird to be used in a poultry catalog or a poultry magazine. More accuracy of detail is required in the latter case, and therefore a more detailed style of rendering.

2. Line Rendering of a Fowl.—Line drawings of fowls are often required by poultrymen to illustrate catalogs and poultry magazines. The material furnished the artist may be a photograph or other illustration, though if a picture of a special bird

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is desired, it will probably be sketched from life. But nobody should undertake to draw a fowl from life until, after careful observation and study, certain parts of the fowl may be drawn from memory. The drawing is usually first done carefully in pencil, as shown in Fig. 1. Carefully shaded marginal sketches may be of assistance in faithfully inking in the subject when it is worked up later. Carefully drawn pencil studies should be made of the particular fowl in different positions, and also

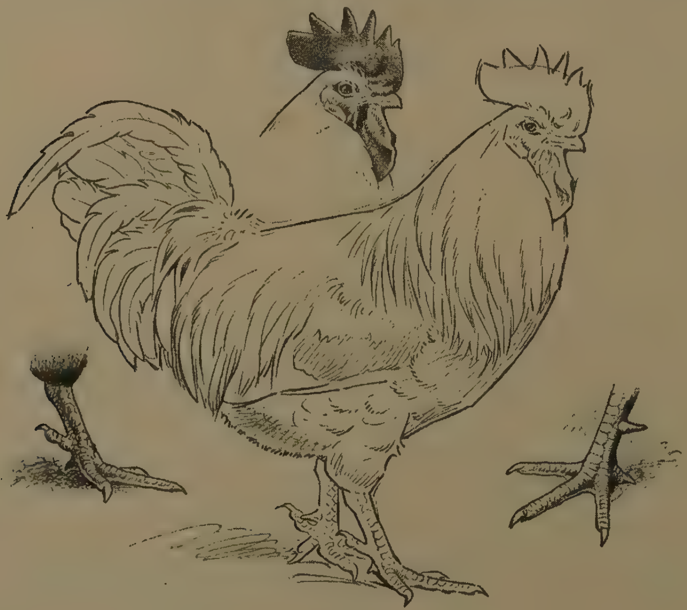


FIG. 1

details of the most important features of that particular variety. This is necessary, in order to do justice to this class of work and to produce a drawing that will bear the criticism of an expert. The surface of comb and wattles may be suggested by using a series of short lines somewhat similar to a stipple; this style lends itself readily to graduating from light to dark. By referring to the detail in Fig. 2, which is the size of the original drawing, the rendering may be more easily studied. A reduced reproduction of the final rendering is shown in Fig. 3,

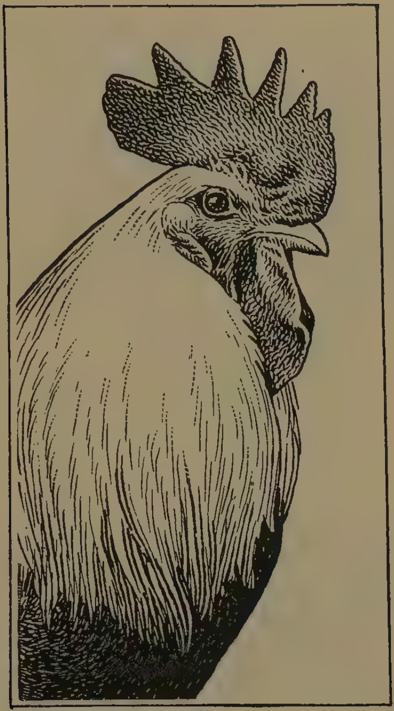


FIG. 2

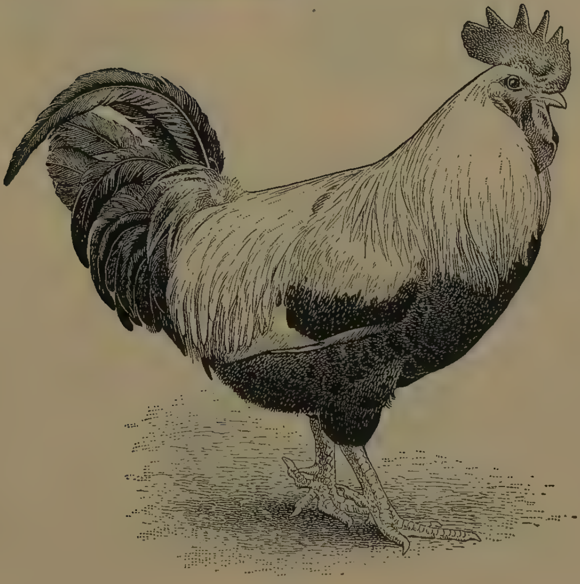


FIG. 3

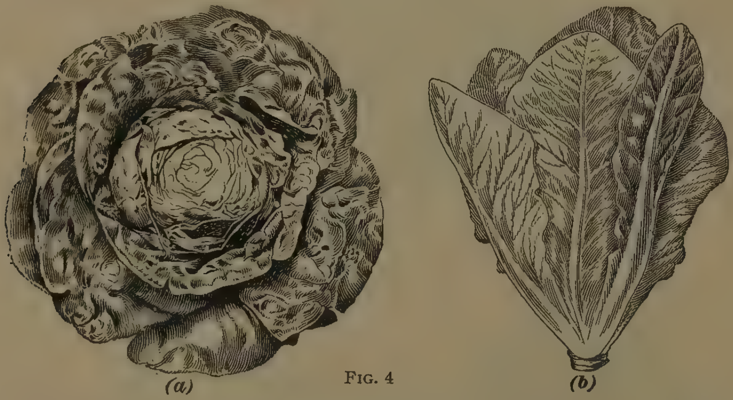
3

I L T 149—6

and the method of rendering each part of the fowl may be noted, especially if reference is also made to the full-size detail in Fig. 2.

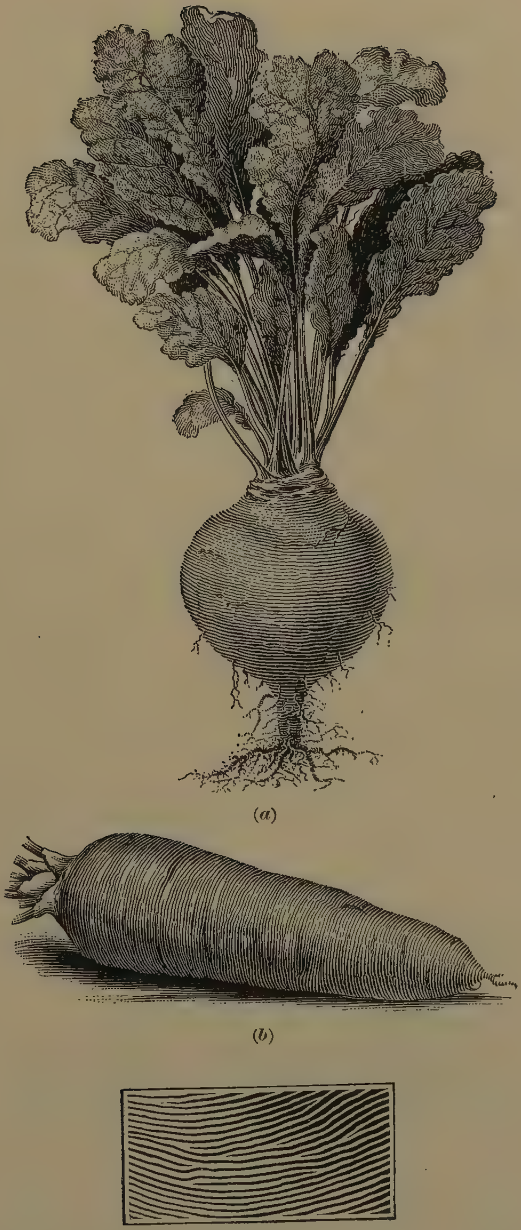
VEGETABLES, FRUIT, BERRIES, ETC.

3. Renderings of Lettuce.—In Fig. 4 (*a*) and (*b*) are shown two varieties of lettuce that have been rendered in a style of technique adapted to suit each subject. In view (*a*), the drawing was first carefully penciled and a wavy style of pen line used to represent the leaves. All hard outlining of the outer leaves was omitted, to avoid bringing them into the immediate foreground. The leaves forming the central part or head were definitely outlined, and by little touches of black combined with dark tints that contrast strongly with the high lights, the central portion or head is brought out in relief.


(*a*) FIG. 4 (*b*)

In view (*b*) is illustrated a more tender and light-colored variety, having less curly leaves; hence, the technique has been varied. The drawing was first sketched in pencil in the usual way, about two and one-half times the size of the illustration, care being taken to insert all details such as main stems, veinings, etc., so that the attention could be confined to the technique when inking.

4. Renderings of Turnips, Carrots, Etc.—When treating such subjects as are shown in Fig. 5 (*a*) and (*b*), the



(a)

(b)

(c)

FIG. 5

surfaces may be represented by slightly wavy lines delicately graduated to bring out the roundness. The high light in this instance contains no white and the deepest shading no solid blacks. The outer edges of the objects are formed by the lines of the shading, which also assist in producing a rounded effect.

The leaves of the turnip are somewhat curly, and a texture made up of wavy lines has been chosen. The lines of shading in the lighter parts of the leaves were cross-lined with white ink, producing a silvery effect. The lines of shading on the turnip are gradually thickened as they approach the shadow side. The thickening of these lines can be done after an even tint has been put in; an expert with a pen, however, can make them with one stroke by gradually putting pressure on the pen. The length of each stroke is usually made from $\frac{3}{4}$ to 1 inch, and each series of lines is neatly joined until the entire surface is covered.

Any streaks due to imperfect spacing may sometimes be improved by thickening the lines. When due to black lines too closely spaced or too heavily drawn, the streaked appearance may be removed by white ink. So far as possible, however, corrections should be made by erasure.

The lines forming tints need not always be continued around the entire surface; one line may stop, and the next line be offset and continue around instead. This method very often prevents a too regular tint, and if the artist has erred, he can return to the general appearance of the lining, and reduce the number of lines without affecting the evenness. Fig. 5 (*c*) shows the offsetting lines used in shading.

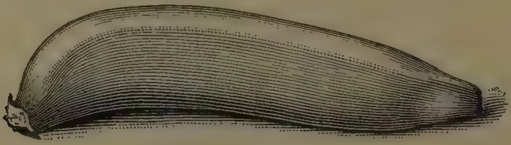
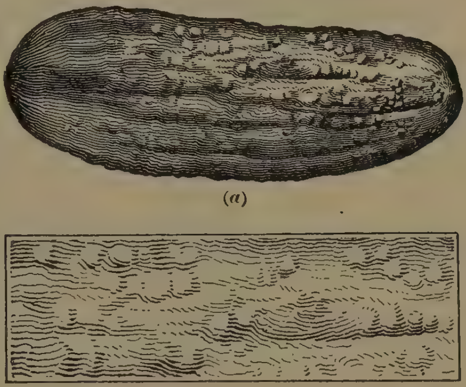


FIG. 6

5. Rendering of Bananas.—In Fig. 6 is shown an illustration of a banana. It has a smooth, kid-glove texture and the shading lines should be very regular and delicately graduated. To prevent too fine and black tinting at the tapering ends of the banana, the number of the tinting lines was reduced by offsetting, as just described. The rounded edge toward the high light is produced by white-ink lines crossing the black lines. An object may be rendered in many ways, as each artist has his own style of technique; but the technique selected should always give the surface of the object illustrated as natural an appearance as possible.

6. Rendering of Cucumbers.—A cucumber, as shown in Fig. 7 (*a*), has an uneven surface, and a wavy style of line will suggest the character. The small raised knobs, which are characteristic, are left white on the light side of the object, while on the shade side they have been very delicately toned down. The lines used here are more wavy and are spaced a trifle wider. An object of this kind is easily sketched in pencil and nearly all the shading suggested, so that the attention may be confined to the rendering when using the pen. In view (*b*) is shown a portion reproduced to the same scale as the drawing.

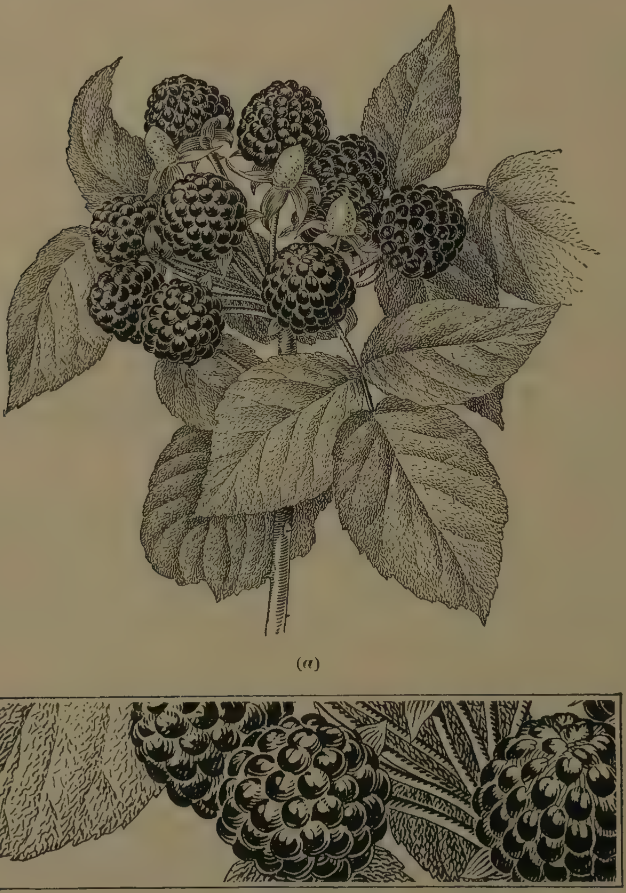

(*a*)

(*b*)

FIG. 7

7. Rendering of Raspberries.—A cluster of black raspberries is an interesting subject to render in line. To treat the berries so that they appear brilliant and definite, as in Fig. 8 (*a*), black shadows with sharply defined high lights are required. The berries most directly in the background have been slightly subdued, particularly in the high lights, which helps the perspective effect.

The leaves are rendered light in color, as the berries are the important feature of the illustration. The style of rendering used on the leaves suggests the texture very well and is easily made up of short, slightly wavy, closely spaced lines; where the tint is darkest the strokes are heaviest, thus forming a darker value. The leaves in the background are grayed over, the high lights appearing only on those in the foreground. A good idea of the spacing and character of the line may be obtained by referring to the full size detail, view (*b*), which also gives the scale of the technique used on the original drawing.

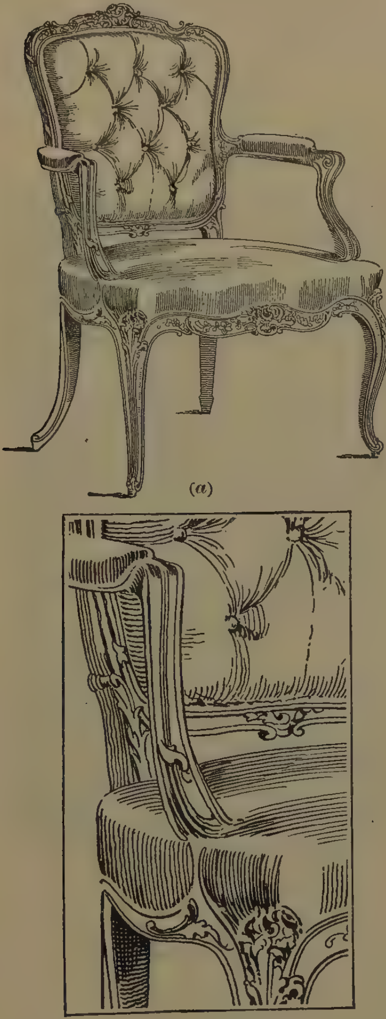


(*a*)

(*b*)

FIG. 8

Other varieties of berries require different methods of treatment, depending on the surface texture. The ambitious student will secure different specimens of berries with accompanying leaves, and make therefrom line drawings, bringing into practice the principles and methods just described.


(a)

(b)

FIG. 9

FURNITURE, CARVED STONEWORK, ETC.

8. Renderings of Furniture.—Line drawings of furniture may be treated in a free and light-colored style, and usually a far better effect is obtained than if an attempt is made to imitate the natural color of the material from which the furniture is made. This style of rendering is very often controlled by the requirements of the manufacturer, whose views on the subject must be respected if one is to be successful in commercial work.

In Fig. 9 (*a*) is shown a chair of antique design, which has been outlined and rendered freehand throughout. The drawing was sketched in pencil, 6 inches high, and reduced to 3 inches high. The style of rendering is good and would be used in a high-grade booklet. For an illustration of an article of furniture in a newspaper advertisement a bolder style of treatment would be required.

In view (*b*) is reproduced a full-size detail from the original drawing of the chair illustrated in (*a*), to show the technique. It will be noticed that firm, sweeping lines are used for the woodwork, while short, curving lines portray the padding and tufting of the upholstered back of the chair.

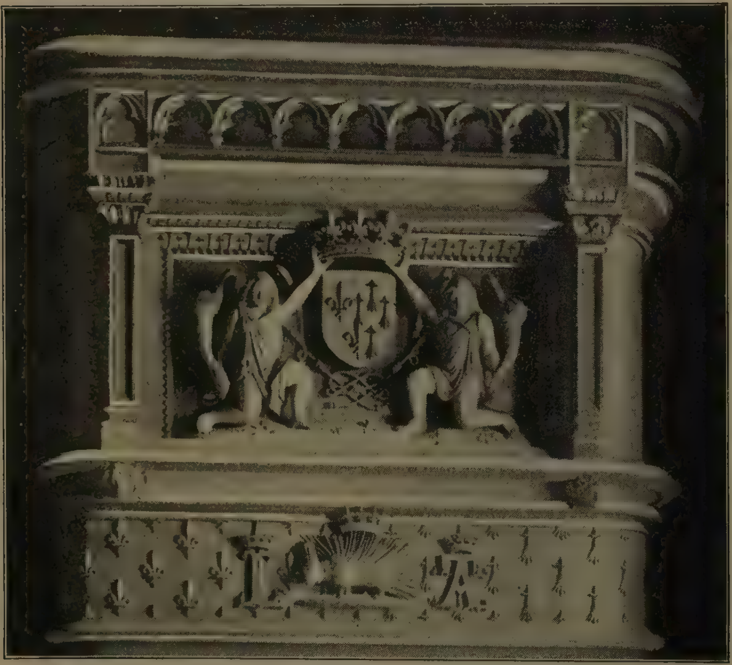
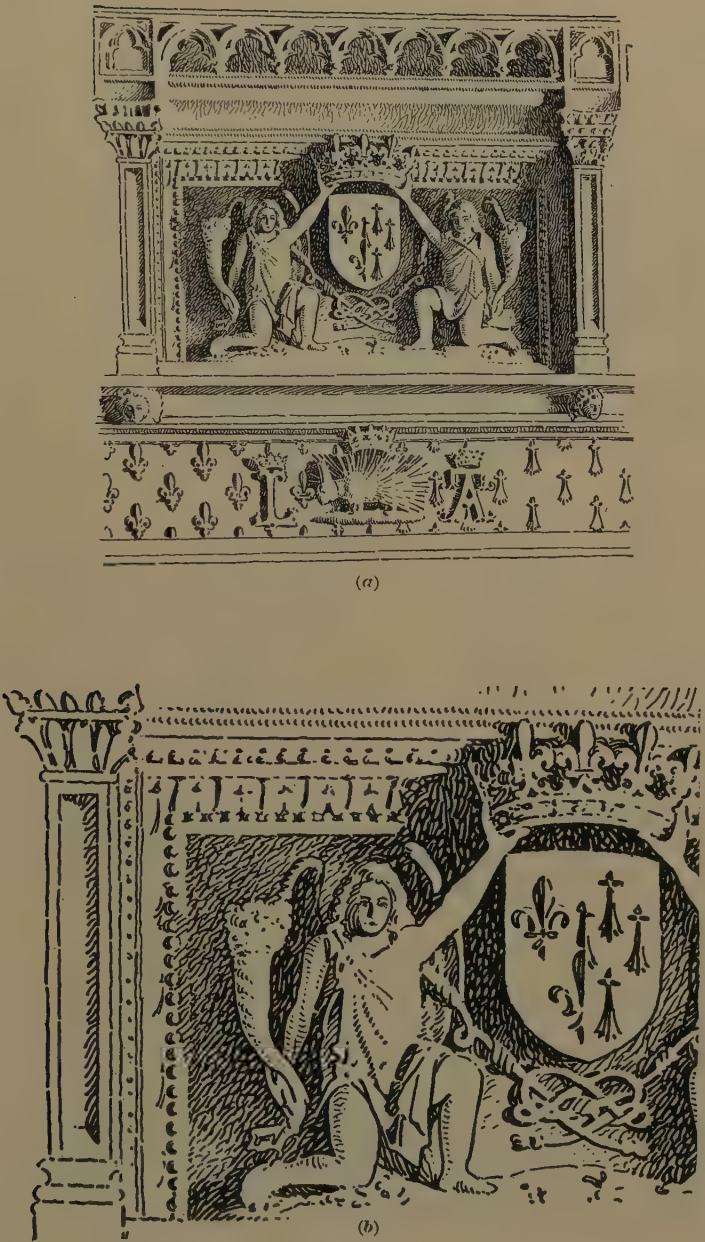


FIG. 10

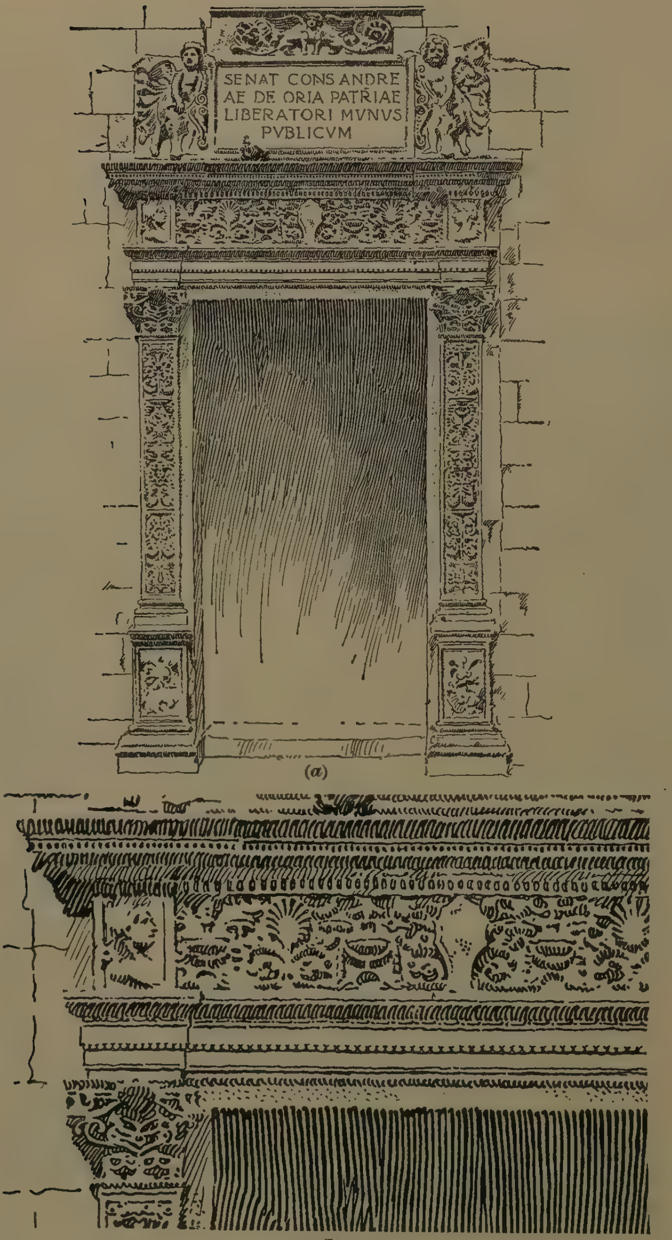
9. Renderings of Carved Stonework.—In Fig. 10 is shown a photograph of a carved-stone mantel, and in Fig. 11 (*a*) the line drawing made from the photograph. By comparing the photograph with the rendered drawing, a good idea may be obtained of the manner in which details are suggested and character maintained by lines so spaced as to form tints that when reduced make a perfect printing plate. In (*b*) is shown a



(a)

(b)

Fig. 11


SENAT CONS ANDRE
AE DE ORIA PATRIAE
LIBERATORI MVNVS
PVBLICVM

(a)

(b)

FIG. 12

portion reproduced to the scale of the original drawing, so that the technique may be studied to better advantage.

10. Building details may be rendered in a variety of ways, depending on the purpose for which they are to be used, the size of the finished picture, and the quality of the paper on which it is to be printed. Building details, to appear artistic when rendered with the pen, require a special treatment, or a hard mechanical appearance is likely to be the result. The subject should be inked freehand; the outlining may be omitted when the shading can be used to define an edge or projection. Subjects of this kind appear to best advantage when illuminated from one side as if in strong sunlight, so that all details may be brought out by well-defined shadows.

11. In Fig. 12 (*a*) is shown a freely rendered example of an Italian Renaissance doorway. The shadows of the greatest projections are treated in a broad style, no attempt being made to define the smaller details. The ornamental work on the frieze and the vertical panels on each side of the doorway have been so suggested that a far better idea of the character of the motifs is conveyed than if the ornaments had been carefully outlined. The original drawing was prepared a trifle larger than double the size of the illustration shown and rendered over a silver print. The scale of the technique used on the original drawing is shown in (*b*).

VARIOUS TREATMENTS OF SAME SUBJECT

12. Building in Simple Outline Treatment.—The examples in Figs. 13, 14, 15, and 16, showing four methods of rendering the same subject, illustrate various methods of practical rendering for the line process. In Fig. 13 is shown a building rendered in a simple outline style because the paper on which it was to be printed was poor in quality and because the scale of the drawing was small. The general character of the building was maintained and sufficient contrast produced by the surrounding foliage. The drawing was made three times larger than the illustration shown. This building is so situated that a good photograph could not be obtained, so it was sketched; other views were used for data and proportion.

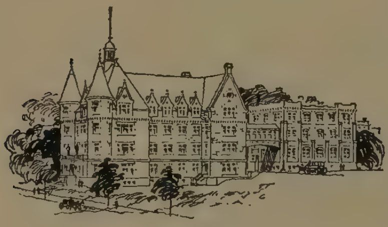


FIG. 13

13. Building in Full-Shaded Line Treatment. The same building is shown rendered in full-shaded line in Fig. 14. This treatment is more complex, as the conditions were different. The engraving was made larger than that shown in the previous example and a better quality of paper was used for printing. Therefore, the tiles on the roof and other details could be added to advantage. This drawing was made double the size of the illustration shown.

14. Building in Smooth Woodcut Style of Treatment.—The two methods of treatment just described are examples of artistic rendering, but would hardly suit the average commercial taste as well as a rendering made with a smooth wood-engraving or lithographic finish, as shown in

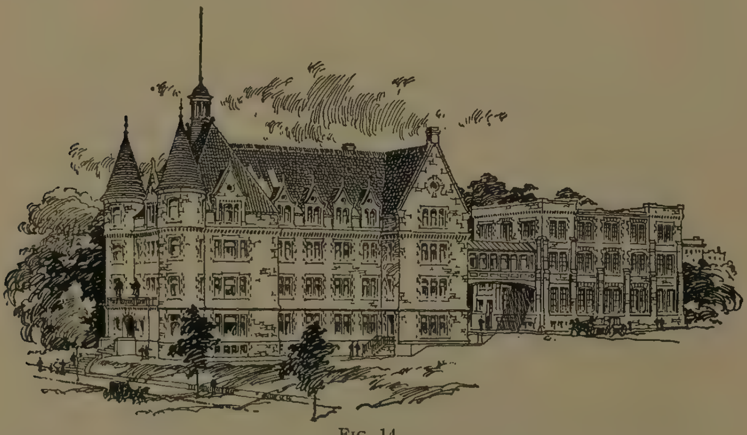


FIG. 14

Fig. 15. This illustration was made three times larger and furnishes a good example of rendering in this style, which

requires very careful and painstaking effort. The sky is one of the most difficult parts to treat, as the black lining must be fine and even, and the white-ink cross-lining also requires great skill to produce a light and delicate effect. This style of rendering, while less artistic, is more suitable for stationery and in combination with lettering. A drawing need not be inartistic because of this restriction in style unless it is carried to an extreme. A drawing can be a very clever and creditable piece of work, even if it is not treated in a sketchy style.

15. Building in Sketchy and Artistic Line Treatment.—Fig. 16 shows an illustration of the same building

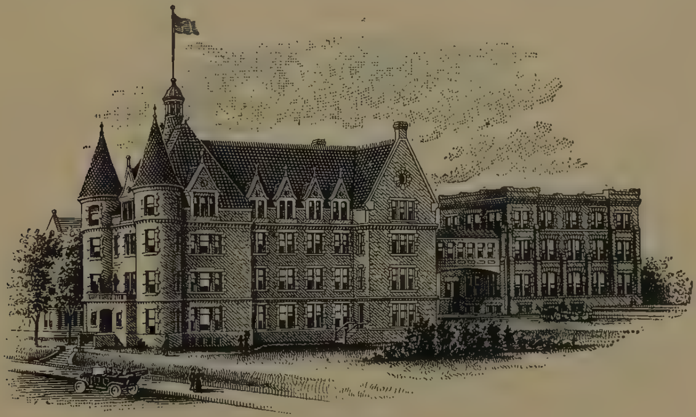


FIG. 15

made to a larger scale than those previously given, which is a fine example of sketchy and artistic treatment. The artist has idealized his subject somewhat by adding trees in the foreground, which greatly assists the perspective effect, gives the tints on the roof a certain value, and also breaks up the long horizontal lines of the building. The style is admirable, the distribution of color very cleverly done, and the detail well suggested. The original drawing was double this size.

Full-shade drawings may be rendered in a style similar to wood engraving, which adapts itself readily to full-shade subjects, and detail and texture are easily brought out. To

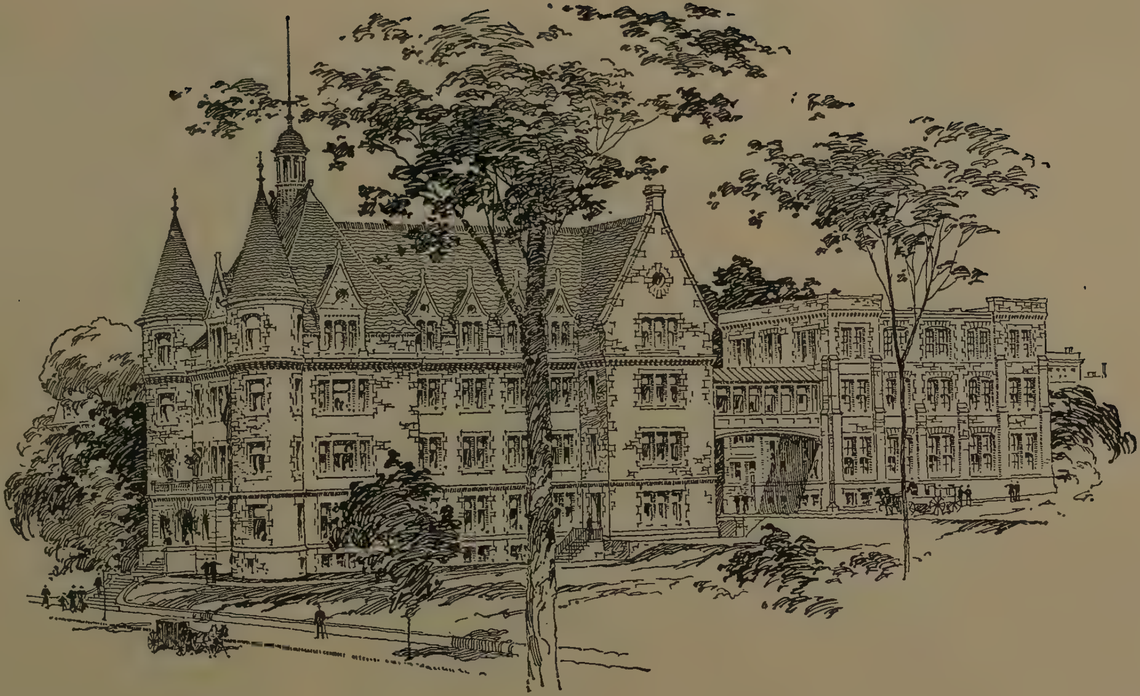


Fig. 16

produce perfect tints, the lines should be uniformly spaced and their thickness should be regulated. A more finished and painstaking style is used in the rendering of freehand subjects for catalogs and technical publications, as manufacturers and commercial men are interested in securing the correct portrayal of textures and mechanical details.

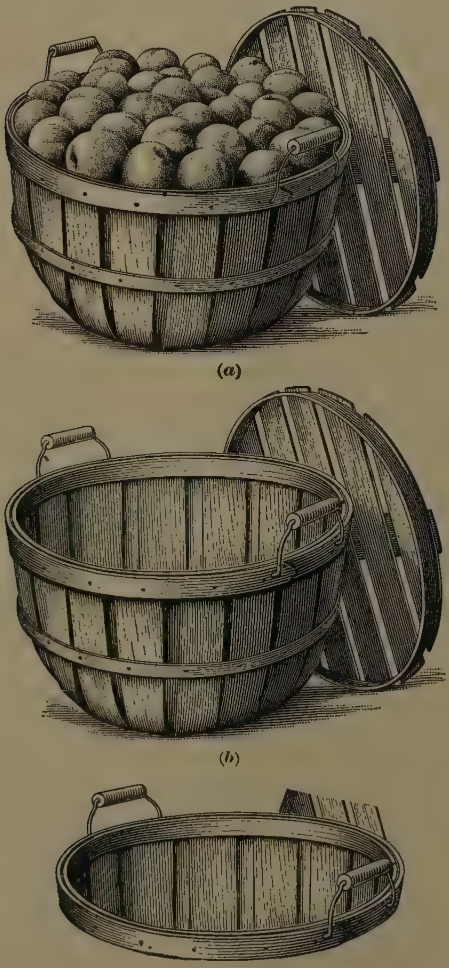
SPECIAL ART-DEPARTMENT METHODS

DIVERSITY OF PRACTICES

16. Need for Short-Cut Methods.—In commercial illustrating work, any practical method is adopted by which time may be saved and the expense of production reduced. Material of every description reaches the commercial artist working for the photoengraver, and some of it in a very crude state, and the artist must use considerable ingenuity and must follow instructions very closely to produce what is required.

The short-cut methods employed in a few of the many miscellaneous "jobs" that present themselves to the commercial artist, will now be considered.

17. One Drawing Serving for Two.—One drawing may sometimes serve as a basis in producing another by using a mask over a portion of it, and adding whatever is necessary upon the mask. For example: drawings were required of a basket of peaches and of an empty basket. The full basket, as shown in Fig. 17 (*a*), was drawn and the stippled texture used for the peaches. The line tinting for the basket was made to follow the general direction of the grain of the wood. The drawing was made double the size of the illustration and rendered for an agricultural publication which was to be printed on a medium grade of paper. To avoid redrawing the basket portion when making the illustration of the empty basket shown in (*b*), a portion of the drawing was covered with a flap of opaque bond paper fastened firmly with rubber cement; by a little additional work, as shown in Fig. 17 (*c*), the flap was produced. Bristol board or heavy paper is unsuitable for this purpose, as it is likely to cast a shadow while being photographed. After the empty basket was photographed, the flap was removed and another negative made to produce the full basket as shown in (*a*).


(*a*)

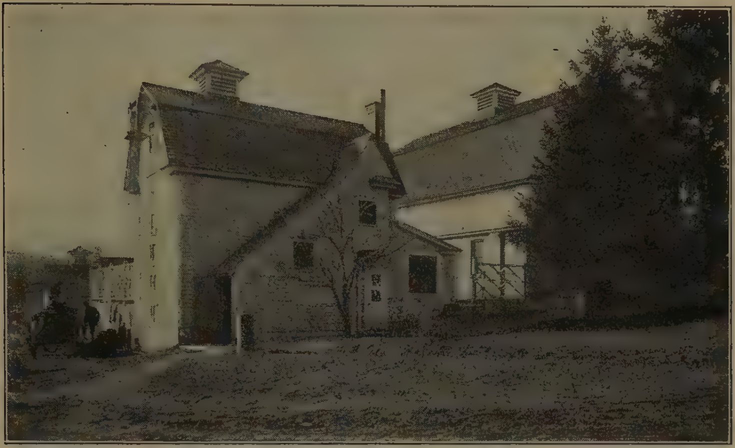
(*b*)

(*c*)

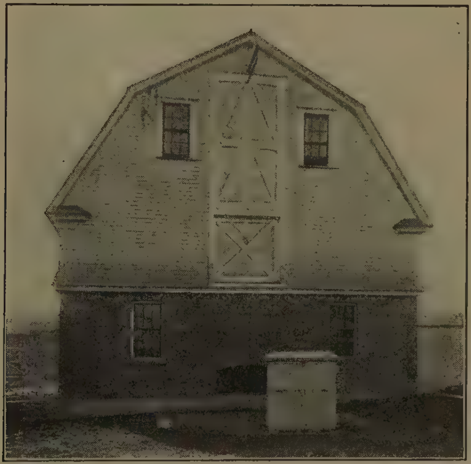
Fig. 17

18. Line Drawing From Altered Photograph.—A view of a building or of a piece of apparatus that will give a more complete, or perhaps varied, idea of it than a realistic photograph, is sometimes desired. Considerable manipulation by the commercial artist is required in such cases. One example is as follows:

19. A good, strong line cut of a dairy barn, that would print well on cheap paper, was wanted. Fig. 18 (*a*) shows a photograph of the barn. The trees were to be removed and the front of the barn brought out in detail. The artist was given a photograph of the opposite end of the barn, which was similar in detail, as shown in (*b*). A pen-and-ink drawing was rendered as far as possible before bleaching over a silver print 8½ inches long. After bleaching, the details obstructed by the trees were penciled and the trees were placed behind the building. The completed drawing is shown in Fig. 19. The cart and the



(*a*)



(*b*)

FIG. 18

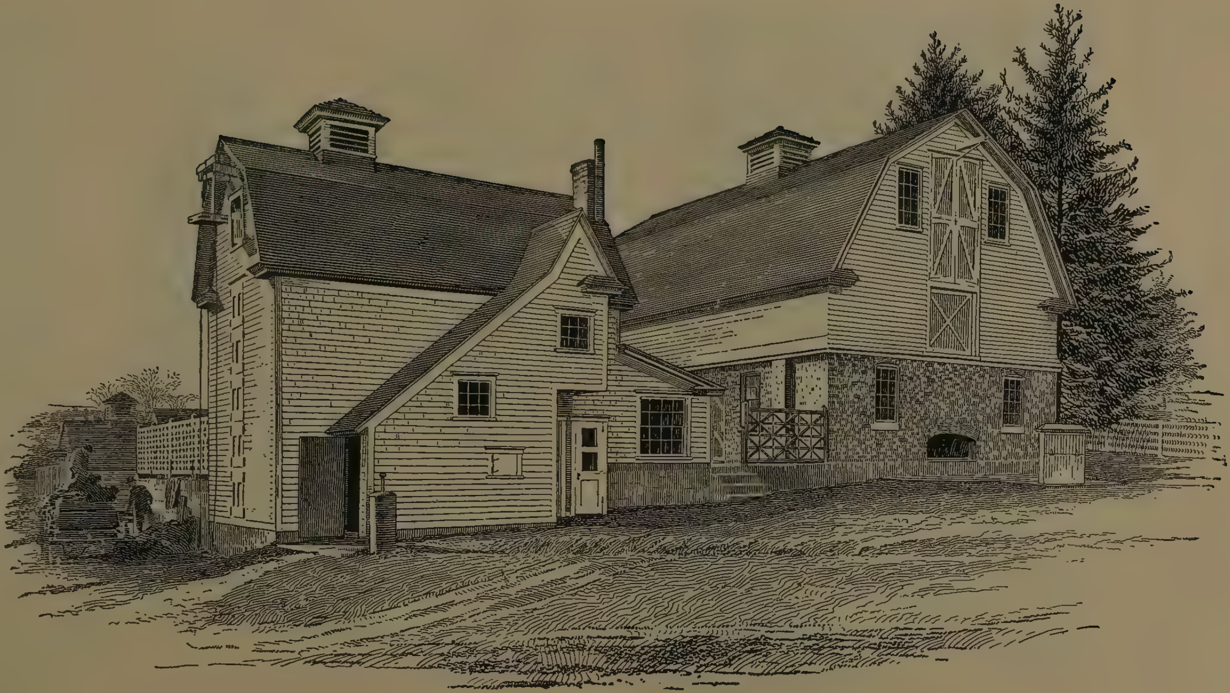


FIG. 19

x

figures at the extreme left were tinted without outline, to prevent their undue prominence from detracting from the building.

While the general plan of light and shade in the photographs has been followed, the surfaces have been kept much lighter. The lines of the siding form sufficient gray for the shade side of the building, and on the light side the lines suggesting the siding have been blended into white and thus furnish sufficient contrast. The lines forming the ground are made straighter and placed closer together as they recede, thus emphasizing the perspective effect.

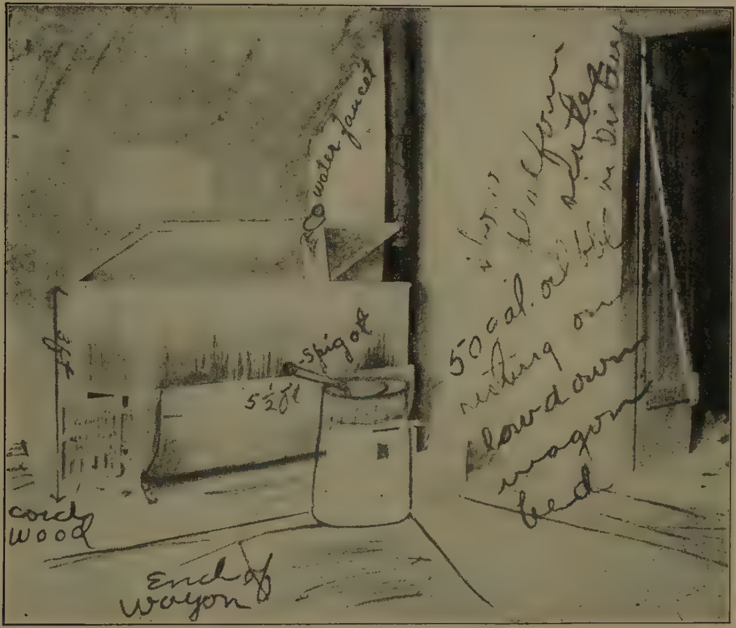


FIG. 20

20. Detailed Drawing From Meager Data.—The artist's ingenuity is sometimes taxed by the demand for a complete drawing for which very incomplete data and sketches are furnished. In Fig. 20 is shown a snapshot photograph of a tank employed by farmers for boiling compounds used for

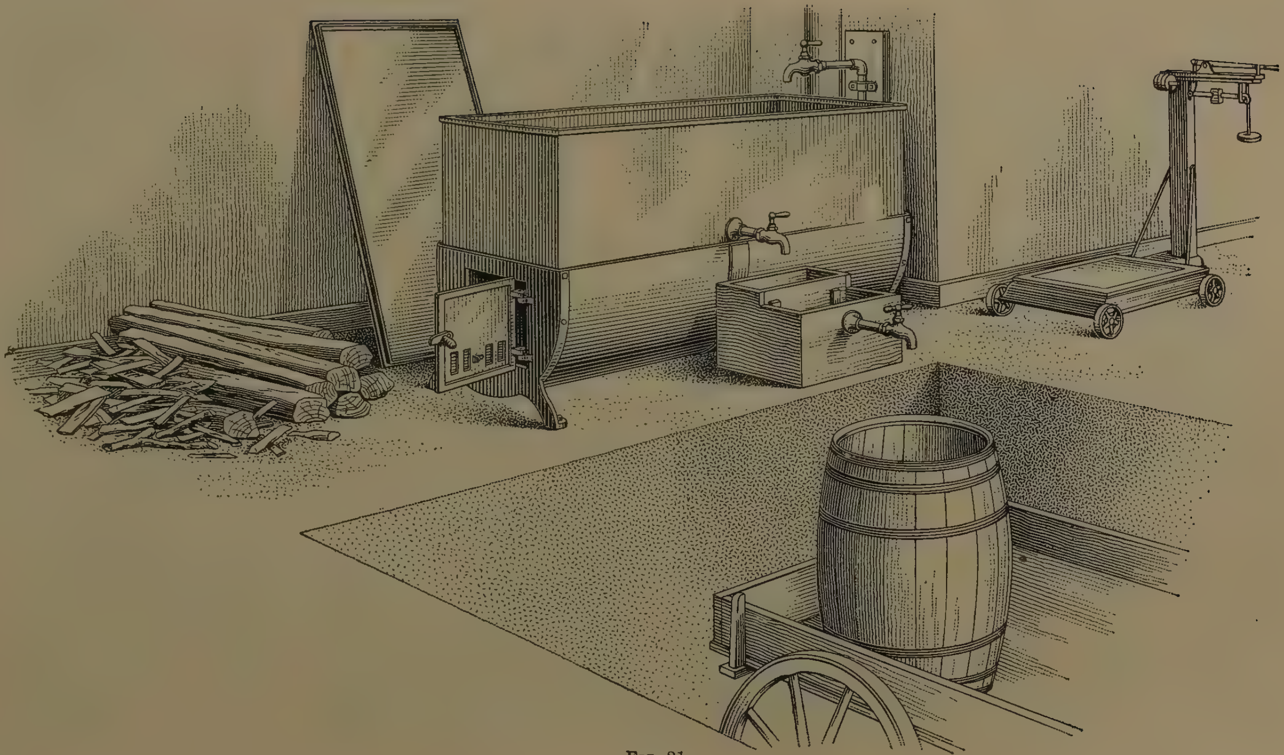


FIG. 21

spraying fruit trees; the farmer desired the entire equipment shown and made notes on the photograph to that effect. The flooring was to be of concrete and shaped to allow a wagon to be backed up in position to fill a barrel without too much handling. A filter to strain the liquid before it entered the barrel was to be put in front of the tank, and a scale for weighing the ingredients was also to be shown. Other details were to be added as suggested on the photograph. The finished illustration is shown in Fig. 21; the concrete has been stippled, and the rest of the work done in line shading, some parts being

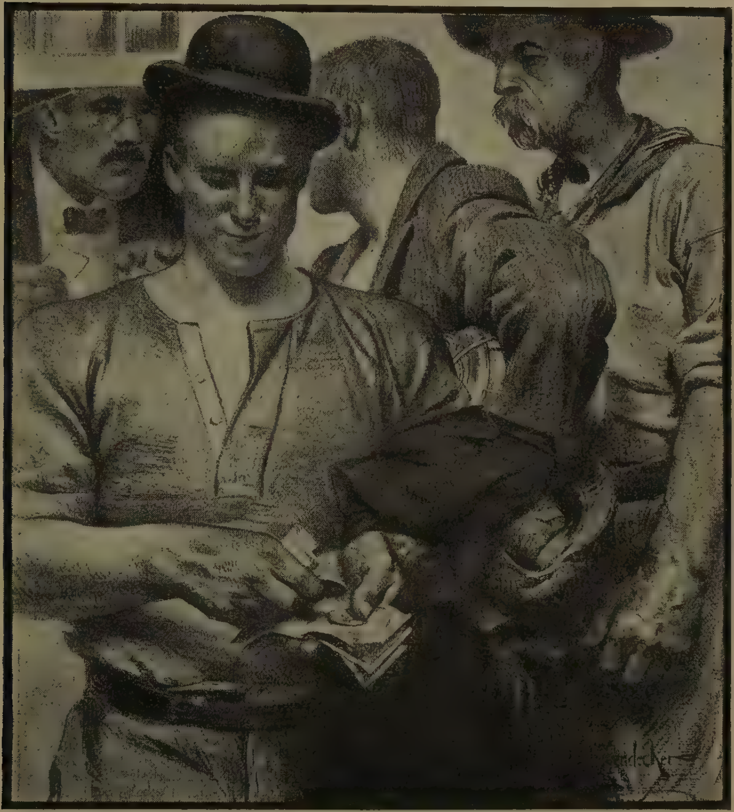
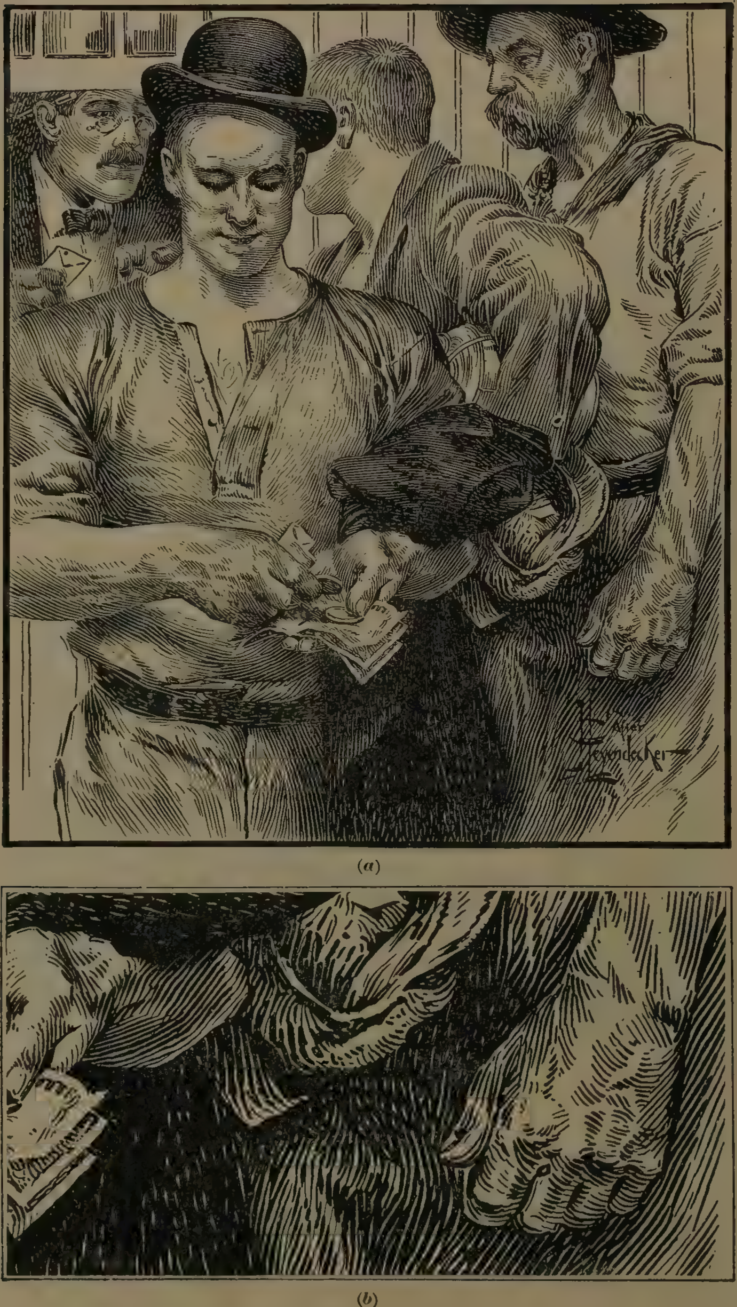


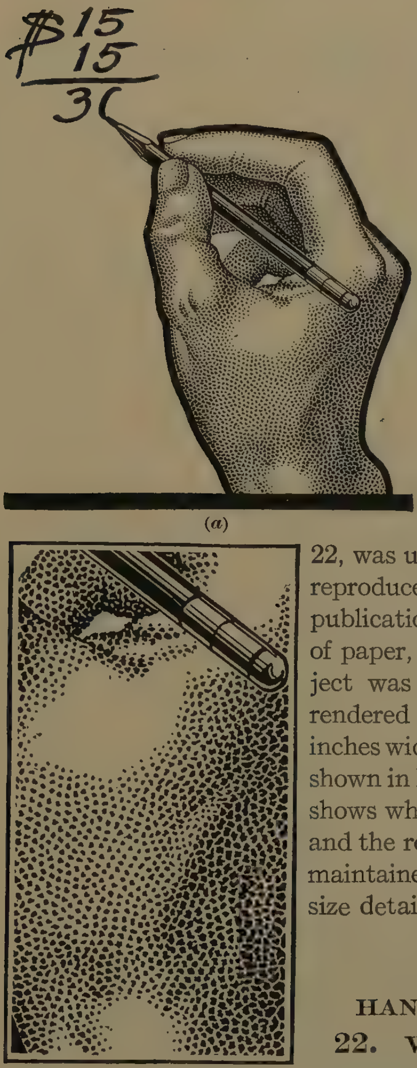
FIG. 22



(*a*)

(*b*)

FIG. 23



(*a*)

(*b*)

Fig. 24

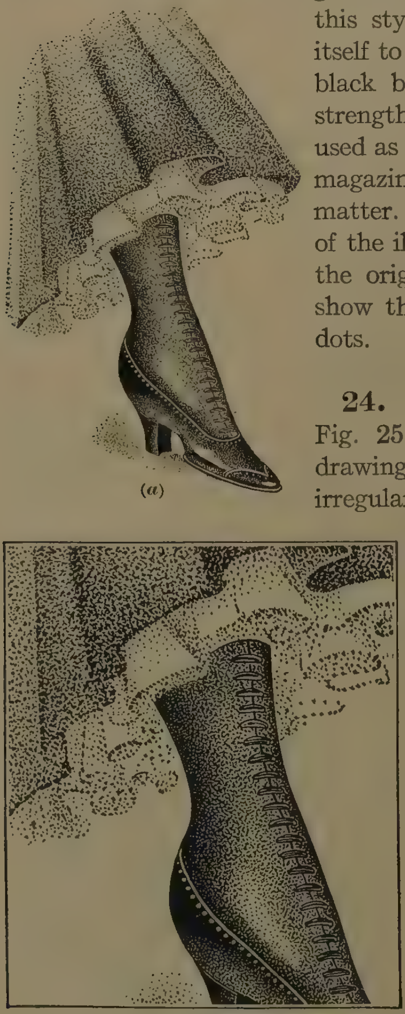
ruled and others drawn freehand. The drawing was made double the size of the illustration.

21. Copy in Line Technique From Oil Painting.—Line drawings from oil paintings, water-color paintings, lithographs, etc., for advertisement illustrations are frequently required in commercial work. The method of doing such work is illustrated in Figs. 22 and 23. A painting entitled "Pay Day," shown in Fig. 22, was used as an advertisement and reproduced in halftone. For certain publications printed on a poor grade of paper, a line engraving of this subject was required. A drawing was rendered in line over a silver print 7⅜ inches wide and reduced to 4 inches, as shown in Fig. 23 (*a*). This illustration shows what portion can be left white and the relative values of the original maintained. In (*b*) is given the full size detail to show the technique.

HAND-STIPPLED WORK

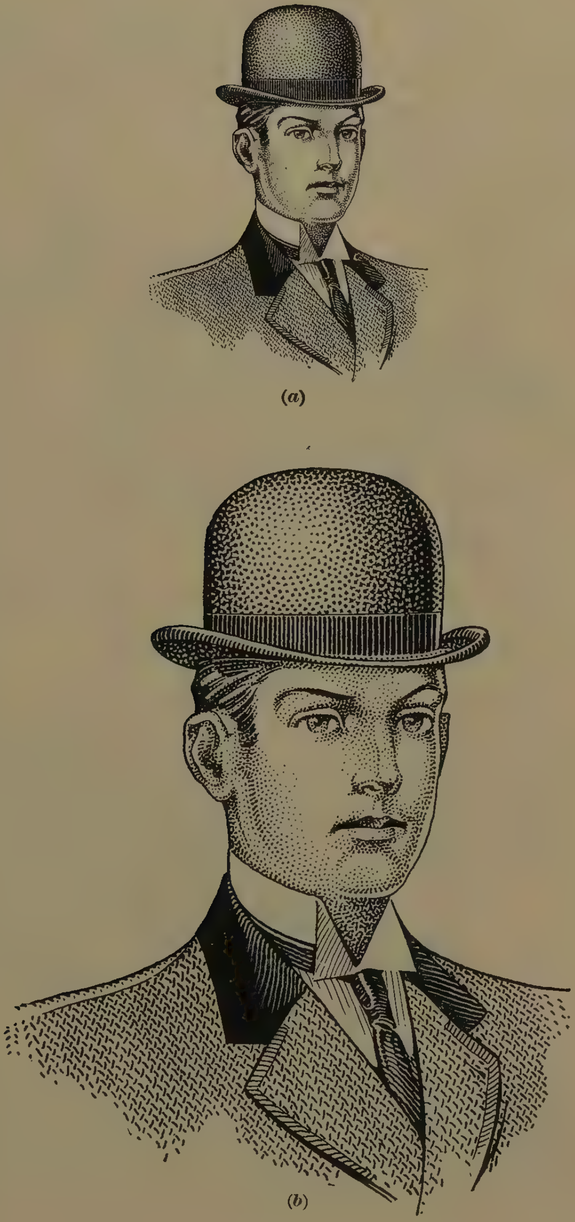
22. Various Styles of Hand Stippling.—Stippling with the pen may be done in various styles. The dots are sometimes of regular shape and are placed in rings when a tint is made, and at other times are irregularly shaped, so each dot may be easily thickened to fit any required space.

23. Flesh Tints.—In Fig. 24 (*a*) is shown an example of stippling made with irregular-shaped dots. The most delicate gradations may be had by using this style and the texture adapts itself to flesh tints admirably. The black boundary line helps to give strength to the illustration as it was used as a column advertisement in a magazine in connection with type matter. In (*b*) is shown a portion of the illustration the same scale as the original drawing was made, to show the sizes and placing of the dots.


(*a*)
(*b*)
Fig. 25

24. Clothing, Hats, Etc. Fig. 25 (*a*), a reproduction of a drawing, shows the suitability of irregular stipple for representing cloth textures. The dots can be nicely graduated into solid black by varying the style of the technique, while good contrast is obtained by varying its coarseness. In (*b*) is shown reproduced full size the original drawing of view (*a*), so that the technique may be carefully studied.

In Fig. 26 (*a*) another example is given of the use of line and stipple combined for clothing, hats, etc. The stippling in the face has been rendered very fine, to produce softness in comparison to the other textures, and is intended to print on a good

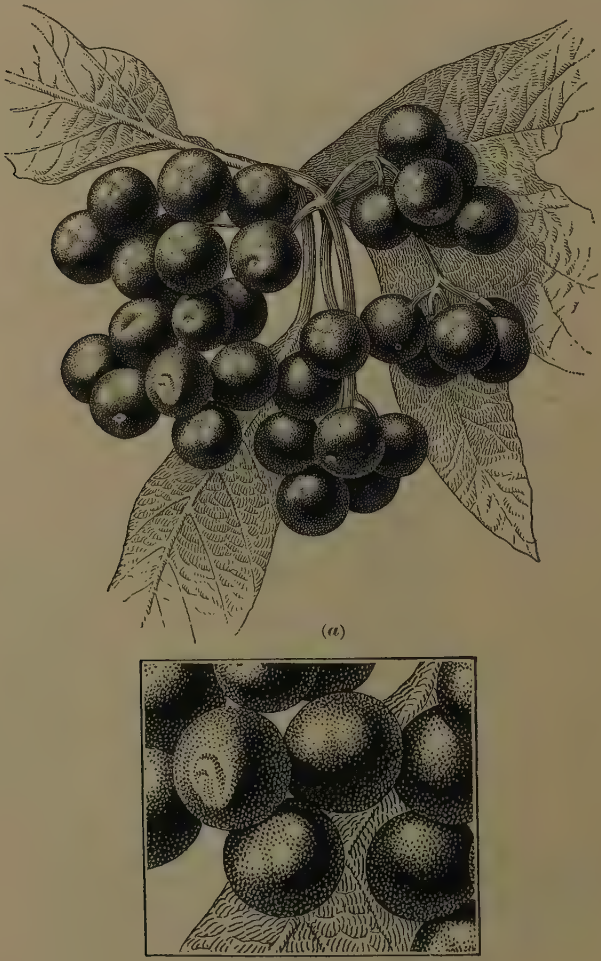


(*a*)

(*b*)

FIG. 26

grade of paper. It would be rather too fine to print on ordinary book paper. In (*b*) is shown a reproduction the size of the original drawing, to give a better idea of the technique.



(*a*)

(*b*)

Fig. 27

25. Stipple and Line Combined.—Fig. 27 (*a*) shows how a stipple style may be combined with line rendering and the effect be harmonious. The berries would have been more

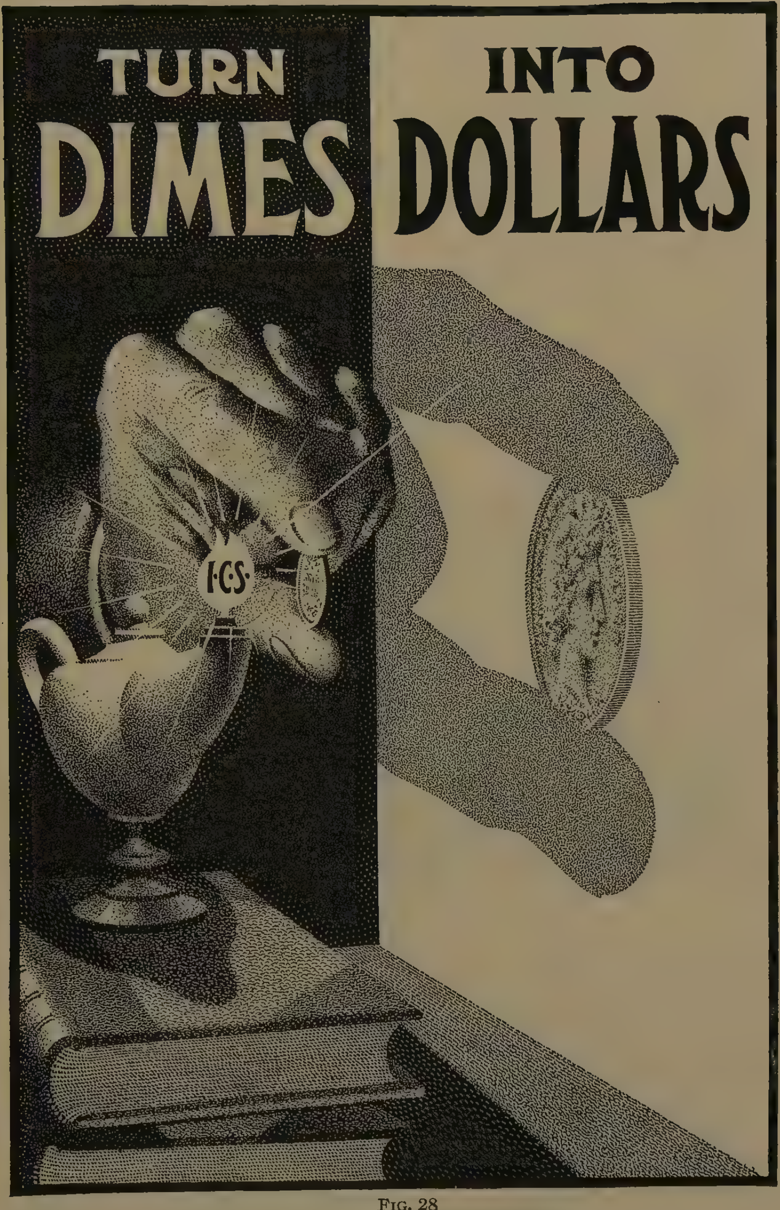


FIG. 28

difficult to produce in any other style, and, as the engraving was to be printed on a cheap paper, a halftone would not have produced first-class results. Line shading might have appeared hard and mechanical and also very difficult to graduate the tints. The leaves were kept light in color, as the berries were the important feature. The main stems and veining in the leaves were carefully suggested by rendering them in a style composed of short slightly wavy lines. The enlarged portion shown in (*b*) gives a better idea of the method of handling.

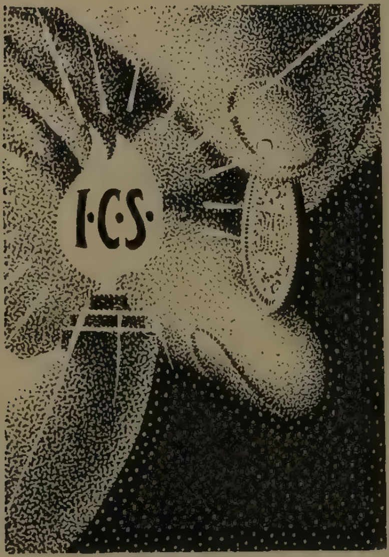


FIG. 29

26. Cover Design in Various Kinds of Stipple.—An advertising idea used as a cover page for a circular is presented in Fig. 28 and shows how different varieties of stipple on the same drawing may be used to produce various effects and unite as a whole. The dark background and shadow of the books on the table were blacked in solid, after which these parts were stippled with white ink. The texture on the books was made with irregular short lines that suggest leather. The leaves in the books have been treated with a series of dots following the general direction of the leaves, and the surface of the table has a texture running toward the vanishing point, which helps the perspective effect. The drawing was laid out double the size and shaded with pencil so that the general effect was obtained before it was inked. All hard outlines were avoided. Fig. 29 illustrates a portion of the design made to the same scale as the drawing and the various textures are more clearly shown.

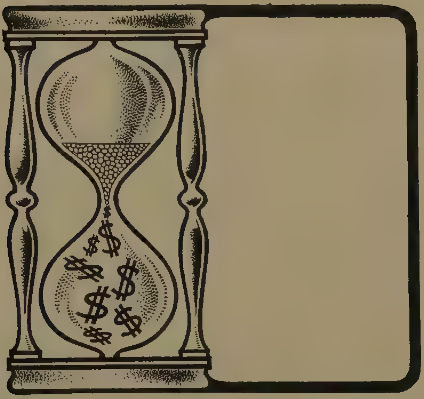


FIG. 30

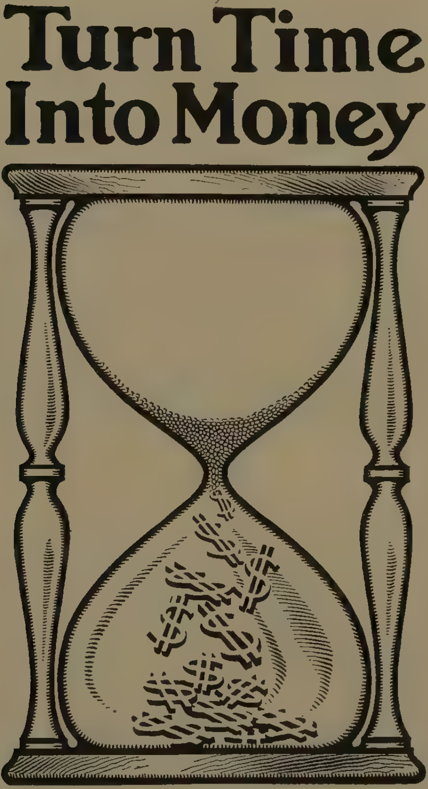


FIG. 31

27. Advertisement Illustrations in Combined Line and Stipple.—In Fig. 30 is shown a design used for a magazine advertisement. An hour glass boldly outlined formed the pictorial part and the space surrounded by the rule border, four points in thickness, was used for type matter. The heavy outline is purely conventional and adopted in advertising to give prominence to the inserted type matter within this outline. The rounded effect produced by stippling helped to soften the mechanical effect of the heavy outline.

In Fig. 31 is given an illustration of a different treatment of an hour glass. The bold outline is softened and a rounded effect produced by the use of short lines. The style is commendable, as it breaks up an otherwise mechanical effect and prints clean. The shading, composed of lines suggesting reflections, is both simple and effective. The method used for suggesting the dollar signs is more artistic than that adopted in the previous example, but no other method would answer in that case, as the scale was rather small and the subject would have appeared weak if treated otherwise. The drawing was made double the size of the illustration. The wavy lines suggesting

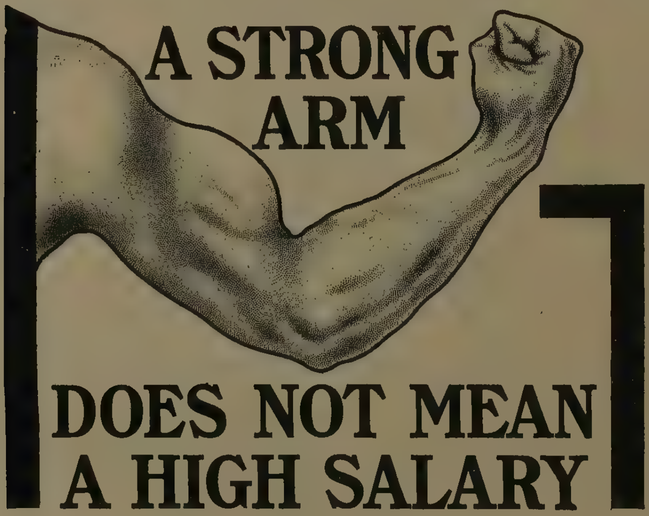


Fig. 32

wood graining furnished a mass of gray and gave the glass portion a more transparent effect.

The lettering has been drawn to give a free style that would harmonize with the character of the design. Headings are often hand lettered, because a condensed type which, in narrow spaces, will give sufficient color and appear more prominent than the design itself, is seldom found. Without detracting from its legibility, hand lettering may be made freer and more artistic than type. The advertising value of a design is often strengthened by using a style of lettering in keeping with the subject.

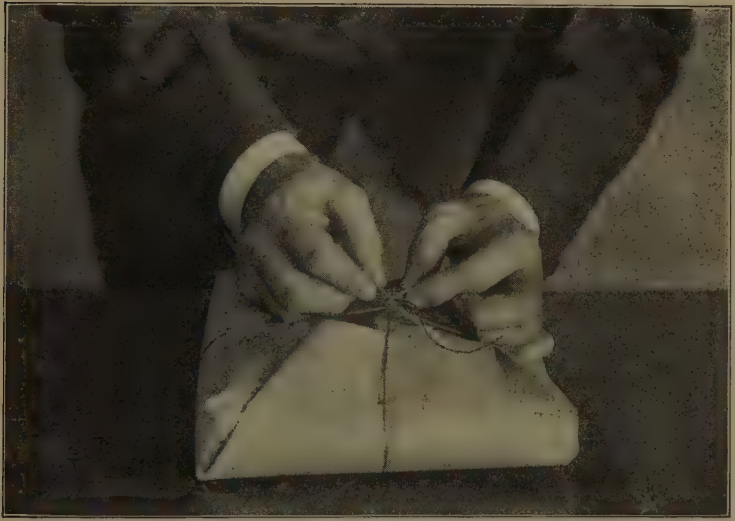
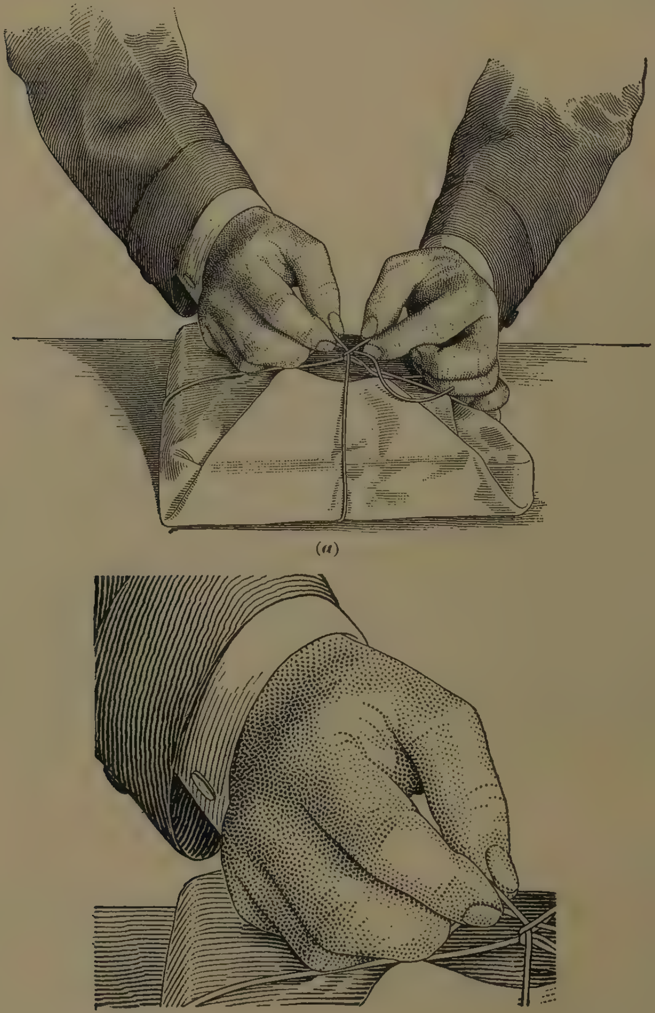


Fig. 33

28. In Fig. 32 is shown a stippled subject for an advertisement drawing, in which strength and boldness are obtained by a heavy outline, which is purely conventional, and in a commercial design is used to bring out an idea more forcibly. The heavy outline also supports the edges of the plate and prevents the dots from increasing in size in printing. Care must be taken, however, to not get the outline so heavy as to overbalance what comes within it.

29. Combined Stipple and Line Drawing From a Photograph.—An example of a combined line-and-stipple drawing made from a photograph is shown in Fig. 34. The photograph shown in Fig. 33 was first taken. The body of the


(a)

(b)

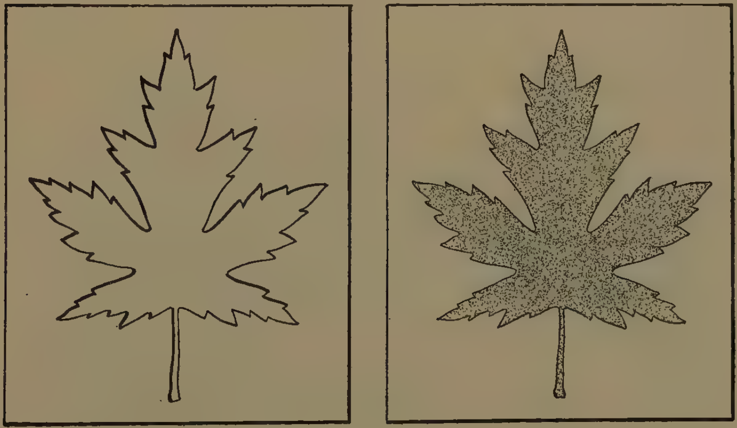
Fig. 34

man was omitted, as the principal idea was to illustrate the position of the hands tying a knot. As shown in Fig. 34 (*a*), a smooth, but slightly wavy, line tint was adopted in rendering the clothing, while the package was kept light and delicate, with only sufficient shading to bring out the form. The lines at the edges were cut with white to produce a blended effect.

This drawing was made double the size of the illustration. The enlarged portion shown in Fig. 34 (*b*) gives the scale of the technique. A comparison with Fig. 33 will show how closely the values of the photograph have been followed and the high lights necessary to give brilliancy when a pen rendering is made. Black masses should be avoided in flesh tints; any desired modeling may be furnished by varying the white areas.

SPATTER WORK

30. Process of Spattering.—Another kind of stippling is known as *spatter work*, a specimen of which is shown in Fig. 35 (*b*).



(*a*) (*b*)

FIG. 35

The earth in the foreground of a landscape, the textures of stones or bricks in buildings, of earthenware, and even of clothing, may be closely imitated by its use. The usual method of employing spatter work is to put drawing ink on the bristles of a toothbrush, hold the brush, bristles down, over the drawing, and scrape a match across the bristles toward the operator. The bristles will fly forwards and throw small particles of ink over the drawing. Or the brush may be rubbed back and forth over a comb held horizontally over the drawing, the ink being thus sprayed, or *spattered*. Little ink is required on the brush; an overplus will run from the brush and drop on the drawing.

31. Mask or Stencil.—If only certain areas are to be spattered, a mask or stencil must be cut from cardboard, according to the shape of the part required. Such a mask or stencil is shown in Fig. 35 (*a*), and the resulting spatter-work effect is illustrated in (*b*). If the area is small and the edges are to be softened, hand stippling with a fine pen point will be needed.

Satisfactory effects by spatter work can only be obtained by very careful etching, as the finer dots become lost, and the closer ones fill up. When reproduced, such a drawing will not stand much reduction for this reason, and plates of this kind must be printed with care on the best grades of paper. Spatter work should not be used for cheap work and newspaper illustration.

ROSS-PAPER WORK

32. Varieties of Ross Papers.—Ross papers have a chalk surface, on which are printed various tints composed of lines or dots, or are embossed with similar patterns. Certain styles combine the printed tints with the embossed patterns. These papers may be worked with pen, brush, or lithographic crayon, and high lights or lighter tints produced by scraping the surface with a knife.

Ross papers are made in three varieties. The first has tints printed on it either in lines or dots, or in a combination of both, and the artist works on the surface with pen and brush. When high lights are desired, or any parts are to be removed, the tint is lightly scraped away with a sharp knife, leaving the plain white surface. For intermediate tints, the color may be lightened by cross-lining, as in Fig. 36, with a properly ground engraver's needle.

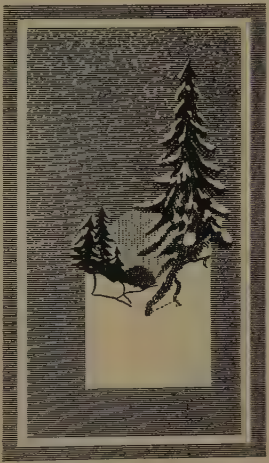


FIG. 36

Another variety of Ross paper has lines or dots both printed and embossed on its surface, so that the printed tint may be strengthened by using lithographic crayon, or the color of the original printed tint may be lightened by scraping over the embossed parts. One specimen of this style of paper, on which has been drawn a landscape, is shown in Fig. 37. Ink may also be used for certain parts.

The third variety of Ross paper has a white surface, on which has been embossed various raised patterns so that textures may be produced by working on the paper with a lithographic crayon.

Ross-paper drawings may be made for newspaper work, if not of too fine a texture to print well. In Fig. 38 is shown an illustration that may be used for newspaper work. The artist's main difficulty when making drawings on this paper is to get the dots black enough where the tints blend into the

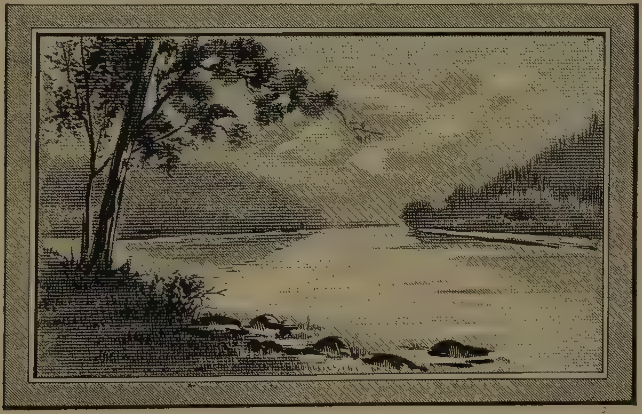


FIG. 37

high lights. If the dots are weak in color, many will disappear when photographed and give a spotty tint. Another difficulty is to get sufficient contrast and keep the tints clean and smooth.

33. Method of Working on Ross Paper.—In preparing a drawing on Ross paper, the amount the drawing is to be reduced should be determined before a sketch is made; otherwise, the artist will have difficulty in selecting a Ross paper of suitable texture or degree of coarseness for the required reduction. Great care must be exercised not to injure the surface. Tracing paper should be used for all preliminary work and sketching, which can then be transferred to the Ross paper.

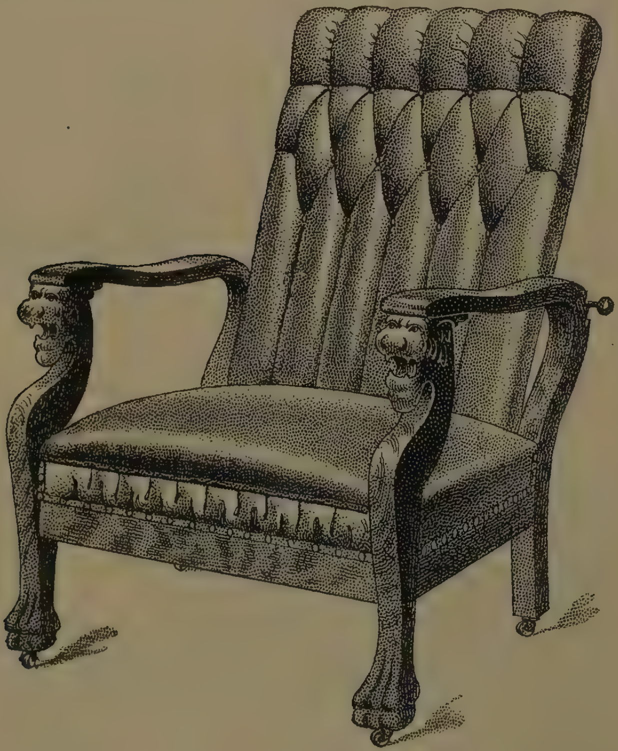
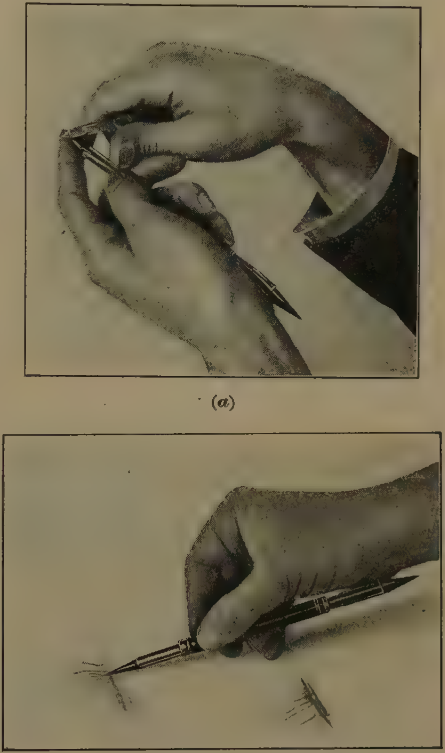


FIG. 38

The back of this tracing paper should be rubbed over with a blue pencil, as blue does not photograph and may remain on the Ross paper, over which the tracing paper is now firmly fastened with thumb tacks. The outlines are next carefully gone over with either a 6H pencil, a sharp steel point, or an engraver's needle. The work on the Ross paper may now be done with crayon, pen, or brush. Before using a scraper, all black work should be completed, as the scraper destroys the texture of the surface, on which crayon cannot be again employed.


(a)

(b)

FIG. 39

34. Use of Lithographic Crayon. Three grades of crayon—soft, medium, and hard—are usually required for work on this embossed paper. The crayon selected should produce a tint without filling the spaces between the dots. Pressure on the crayon will cause a spotty tint.

To sharpen the crayon, hold it as shown in Fig. 39 (*a*) and cut from the point, in the reverse way to which a pencil is sharpened. While working on Ross paper the crayon should be turned at each stroke, as the point is thus more easily kept sharp. To touch up the point, the crayon should be rubbed on another piece of paper with a right-and-left and forward movement of the stick, meanwhile turning the crayon, as shown in (*b*). A small burr which will form at the point is removed by this method. This burr, unless first removed, is likely to come off the point, get in the grain of the paper, and cause a spot that must be picked out with a sharp-pointed knife or an engraver's needle.

35. Tints for Various Textures.—Dark clean tints can be obtained only by gradually going over the surface with the crayon, of which the raised dots will take their proper proportion and form a clean tint of the desired shade. In Fig. 40 (*a*) is shown the first stage of the work when making an even medium tint. Firm definite strokes made with a light uniform pressure and placed as close as possible without overlapping, produce the cleanest tint. The main foundation is thus laid and the small white spaces left between the strokes are lightly gone over until all irregularities disappear and a uniform tint is produced. View (*b*) shows the tint completed. The crayon should have a somewhat blunt point.

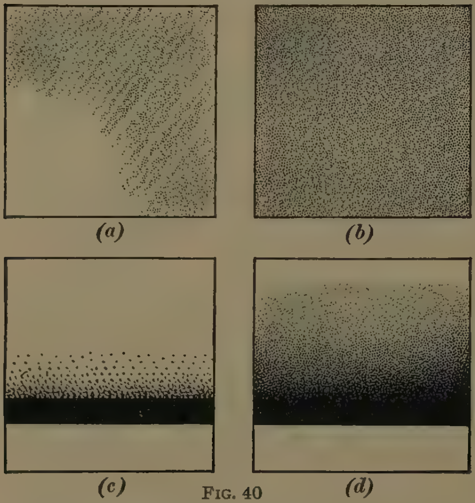


FIG. 40

36. Graded tints that begin with a very delicate shade, gradually darken, and finally blend into solid black are difficult to make unless some of the surface toward the darker part is stippled with ink. This process not only adds to the color, but forms a tooth that helps the surface to hold more of the crayon. Sometimes small spots that have closed in must be separated by using an engraver's needle that has been sharpened to a chisel edge. The method of stippling with ink is shown in Fig. 40 (*c*), and the appearance of the graduated tint, after applying the crayon, is illustrated in (*d*).

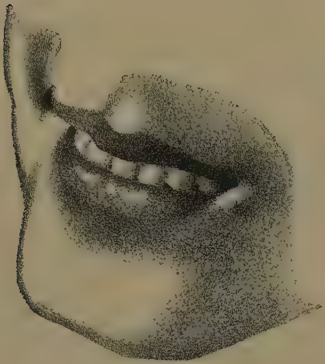


FIG. 41

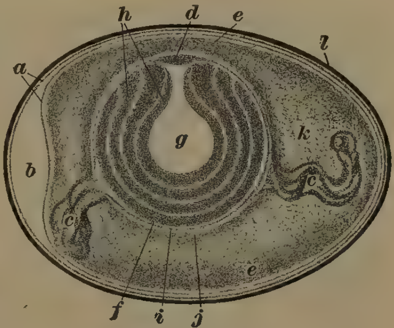


FIG. 42

A portion of a face that has been prepared on Ross paper is shown in Fig. 41 and is suitable for printing on an enamel paper. The drawing was made one-half larger than the illustration.

37. For scientific subjects Ross paper and lithographer's crayon may be used to advantage, as delicate gradations and textures may easily be produced on the paper. A sectional view of an egg so made is shown in Fig. 42, and could not be equalled in pen work. The main outline and lettering were made with ink.

(*a*) FIG. 43 (*b*)

The carved-stone acanthus in Fig. 43 (*a*) shows another application of the Ross paper, producing the stone texture beautifully. The darker spots were put in with ink and the crayon tints in the darkest shades were strengthened by adding stippling with ink. View (*b*) is a reproduction made to the same scale as the original drawing.

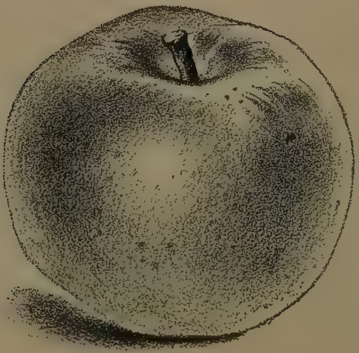


FIG. 44

38. Subjects like an apple, as shown in Fig. 44, are very difficult to render in ink, but with crayon on Ross paper the work is very simple, artistic, and effective. The strawberry, as illustrated in Fig. 45, has a surface that may be suggested easily on Ross paper. The seeds, as well as the darker tint on the under side of the leaves, are emphasized with ink. The drawing was made one-fourth larger. The price of this class of reproduction is higher than for engravings made from line drawings, on account of the extreme care required in preserving the dots while etching the plate.

39. Rendering on Charcoal Paper.—The method just described may be used to get certain effects on charcoal paper and other papers of rough texture, provided the tints are not smudged, the crayon work is kept crisp and sharp, and the subject is not too much reduced. In Fig. 46 is shown a night scene, the original of which was drawn on charcoal paper and the high lights painted in with white. The figure and other black portions were put in with ink. To avoid getting a night scene heavy and black in the rendering is not an easy task.

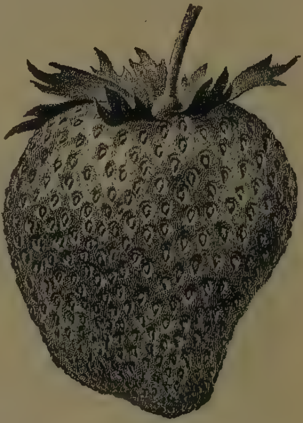


FIG. 45

In Fig. 47 is another example made with crayon on charcoal paper; a certain freedom, obtained by this medium, would be more difficult to maintain if rendered with pen or in wash.

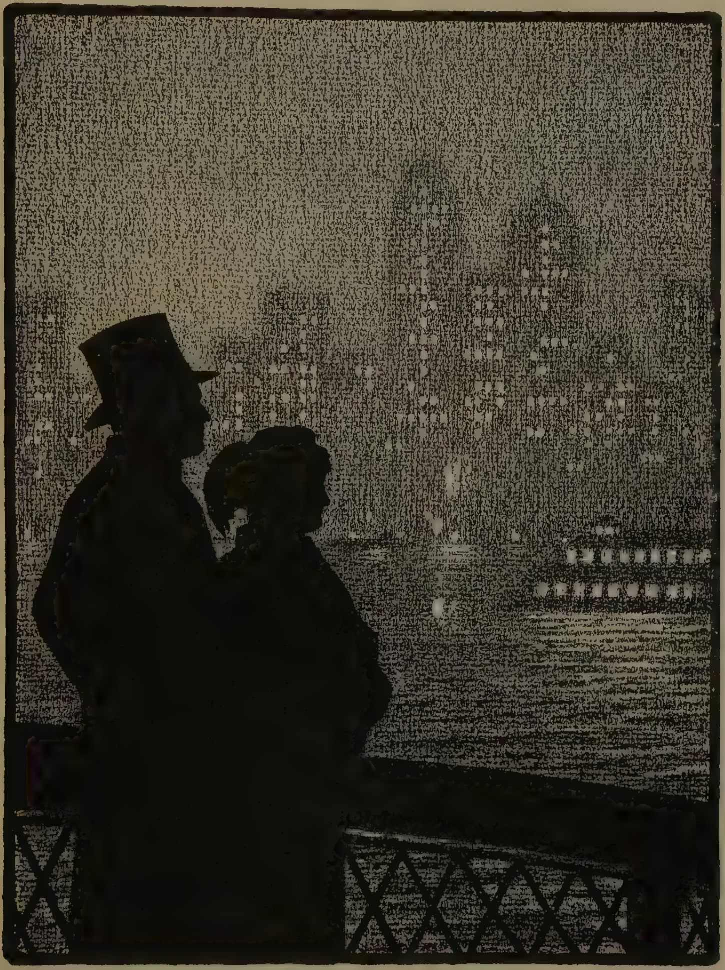
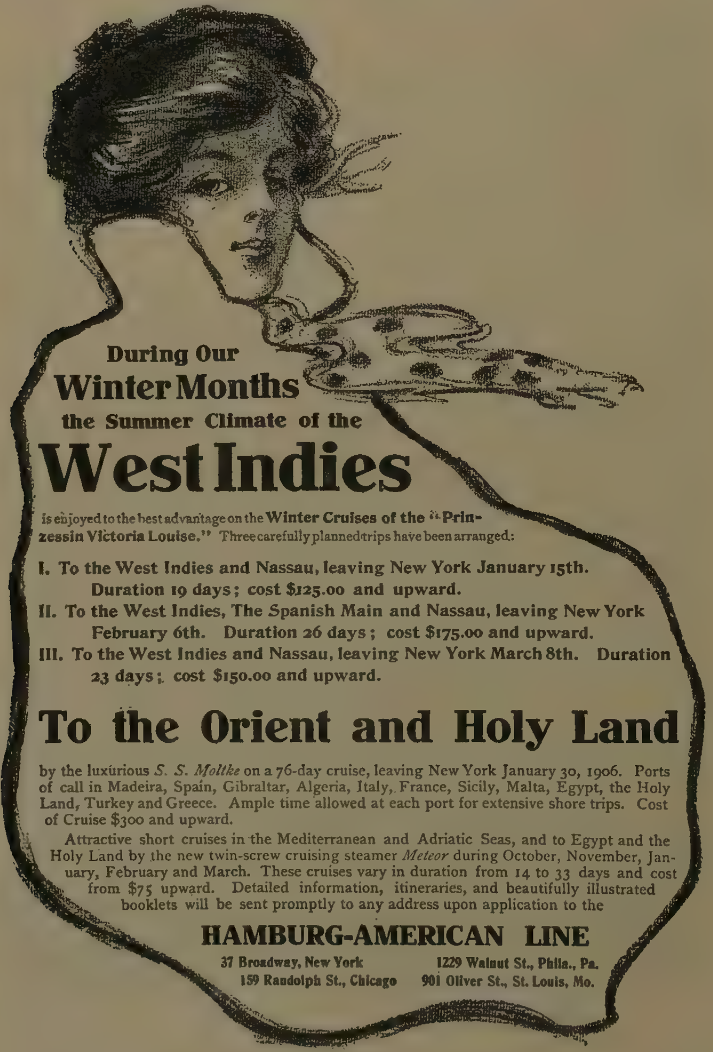


FIG. 46

All erasing should be avoided. The texture of the paper must be kept in good condition, as all shading should be composed of clean black dots; otherwise, the result when reproduced will be a white spot or muddy tint. Advertising designs are often treated in this manner. When drawings are made with ordinary crayon or charcoal they should be sprayed with thin fixative to prevent the medium from becoming rubbed.



During Our
Winter Months
the Summer Climate of the
West Indies

is enjoyed to the best advantage on the **Winter Cruises of the "Prinzessin Victoria Louise."** Three carefully planned trips have been arranged:

I. To the West Indies and Nassau, leaving New York January 15th. Duration 19 days; cost $125.00 and upward.
II. To the West Indies, The Spanish Main and Nassau, leaving New York February 6th. Duration 26 days; cost $175.00 and upward.
III. To the West Indies and Nassau, leaving New York March 8th. Duration 23 days; cost $150.00 and upward.

To the Orient and Holy Land

by the luxúrious *S. S. Moltke* on a 76-day cruise, leaving New York January 30, 1906. Ports of call in Madeira, Spain, Gibraltar, Algeria, Italy, France, Sicily, Malta, Egypt, the Holy Land, Turkey and Greece. Ample time allowed at each port for extensive shore trips. Cost of Cruise $300 and upward.

Attractive short cruises in the Mediterranean and Adriatic Seas, and to Egypt and the Holy Land by the new twin-screw cruising steamer *Meteor* during October, November, January, February and March. These cruises vary in duration from 14 to 33 days and cost from $75 upward. Detailed information, itineraries, and beautifully illustrated booklets will be sent promptly to any address upon application to the

HAMBURG-AMERICAN LINE

37 Broadway, New York
1229 Walnut St., Phila., Pa.
159 Randolph St., Chicago
901 Oliver St., St. Louis, Mo.

FIG. 47

HAND-SHADING OF MECHANICAL SUBJECTS

40. Mechanical subjects that are to show detail and print on ordinary paper are best illustrated by line drawings. All mechanical devices are composed of simple forms having surfaces that may be broadly classified as flat, cylindrical, conical, concave, convex, and spherical. These surfaces may be represented pictorially by shading made up of lines of various thicknesses. The size of the piece to be shaded and the amount the drawing is to be reduced determine the spacing of the lines.

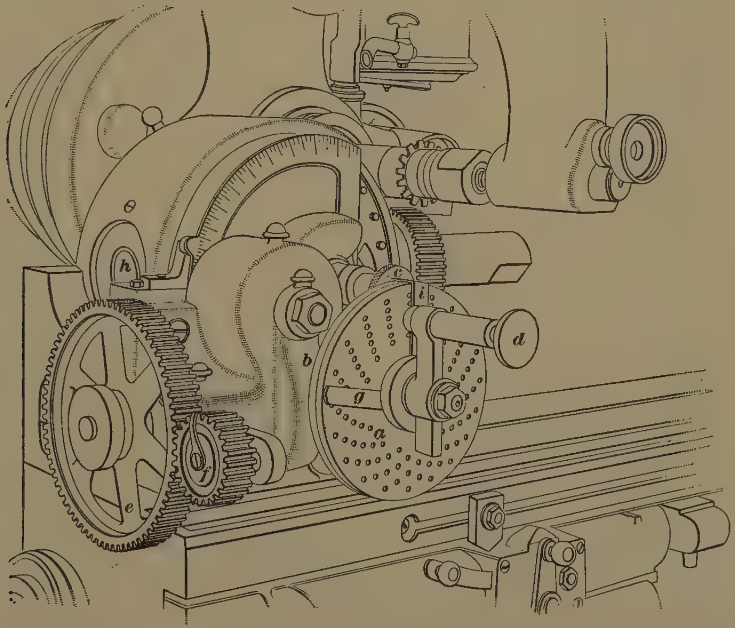


FIG. 48

41. Method of Using Shade Lines.—Perspective drawings of mechanical devices are often rendered in outline style and the effect brought out by the use of shade lines. An example of this kind is shown in Fig. 48. This illustration was made from a photograph and a few rough sketches suggesting an alteration. A silver print was first made, double the size of the illustration. Indistinct detail, rounded edges, as well as those parts that were to be altered, were drawn in pencil. A firm, sharp, ink outline was used, and was slightly heavier than if the subject were to be shaded. After the machine was outlined, the perspective effect was greatly improved and parts brought in relief by the use of shade lines.

To give a rule for placing these shade lines so that the result will always be satisfactory is a difficult matter. A fairly good plan is to emphasize projecting corners that are to be brought out prominently, or to consider the subject as if it were to be shaded with line tints, which determine the edge to be shade-lined.

The apparent weakness of an outline drawing will often be overcome by a strong line properly placed. All imperfections of an outline drawing are more prominent than those of a surface-shaded subject. All ellipses must be carefully outlined with ink, using an irregular curve. These outlines are made in short sections and carefully connected, so that the curved line appears smooth when finished. A ruling pen may be used for all straight lines and for medium-sized curves, but for small ellipses an ordinary No. 170 Gillott's pen, passed carefully around a regular curve, produces the best results. Too much ink must not be used on the pens, and several thicknesses of paper or a piece of cardboard should be placed underneath the curve, to raise it from the surface of the drawing paper, letting the edge of the curve project a trifle beyond, to avoid blotting. The irregular curve will accumulate a certain amount of ink, which must be carefully wiped off before it gets underneath the curve. The pen should be held at a slight angle in the direction in which the line is being drawn, that it may not scratch the paper and cause ragged lines. An even pressure on the pen to get the uniform thickness of lines may be accomplished by a little practice.

42. Shading Cubic Forms.—In Fig. 49 (*a*) is shown a perspective view of a cube, shaded with lines. The surface *a* is illuminated from the left and at some distance in front of the object, and at a height sufficient to illuminate the top of the cube. The light side *a* is shaded with vertical lines and slightly graduated until the shading blends into the white paper. The dark side *b* shows the strongest color at the top corner nearest the eye, and graduates into light gray. The top surface is shaded at the corner farthest from the eye, so as to tone it down and keep it subdued, and to emphasize the high light on that surface. For one-half reduction the number of lines per inch range from thirty-five to forty, according to the size of the piece to be shaded. Receding planes, such as *b*, are ruled finer. A series of vertical lines ruled to form a tint will appear coarser if turned in a horizontal direction; hence, tints that are ruled in a horizontal direction should be made slightly finer,

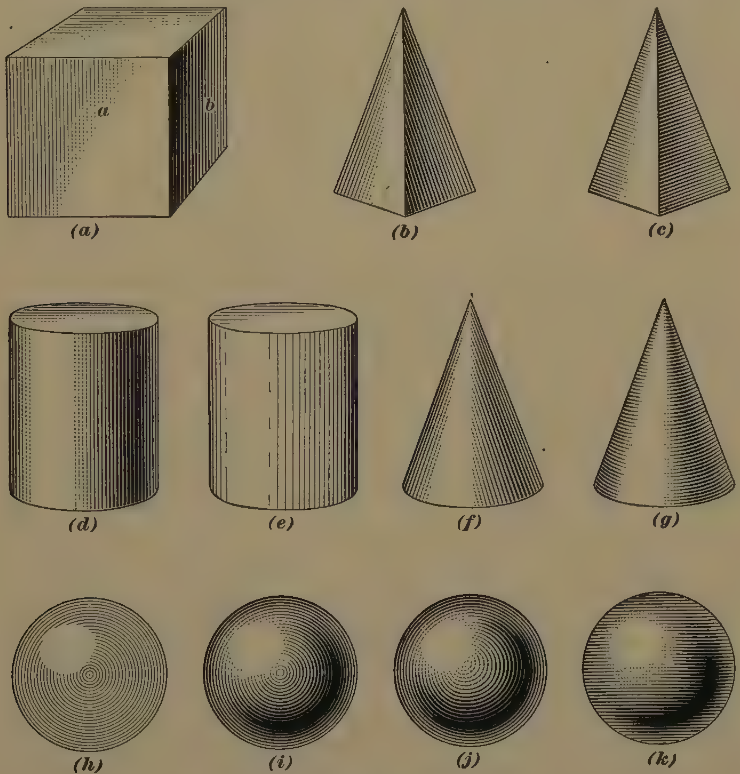


FIG. 49

to appear uniform with the vertical tints. The light tint on the surface *a* of the cube is graduated to a soft edge by use of white ink cross lines. Black lines should be cross-lined with white ink as nearly at right angles as possible, to avoid a coarse appearance and a pattern effect.

43. Shading Pyramidal Forms.—A pyramid may be shaded in two different ways, as shown in Fig. 49 (*b*) and (*c*). In (*b*) the lines of shading are made parallel to the outer edges and intersect the front vertical edge on the shade side of the pyramid nearest the eye. The lines forming the shading, when run parallel to the base lines of the pyramid, as in (*c*), must be thickened to get the graduated effect. This class of work requires a good knowledge of light and shade, and skill in the ruling and blending of lines, which must be acquired by practice.

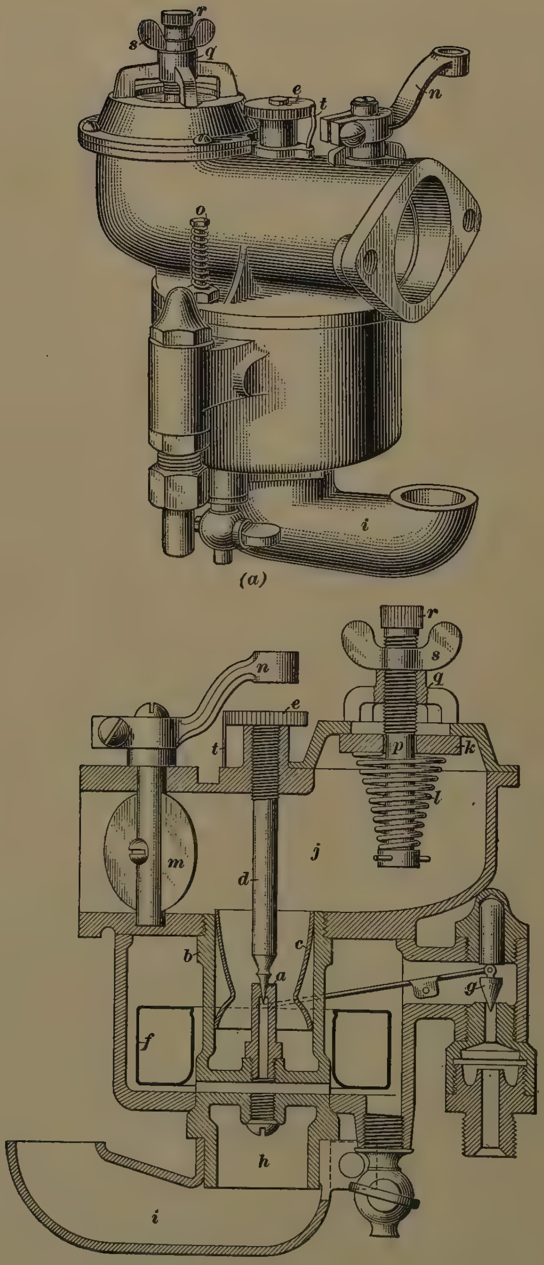
44. Shading Cylindrical Forms.—The roundness of a cylinder, shown in Fig. 49 (*d*), is produced by gradually thickened shading lines, so that the drawing when held at a distance from the eye gives the same gray effect as a wash drawing or a photograph. Too much space between the lines, as the tinting approaches the high light, should be avoided, as these lines usually get heavy in printing and the work then appears coarse. In (*e*) is shown the wrong way of shading a cylinder.

45. Shading Conical Forms.—A cone is difficult to render with lines converging to the apex, as they soon become too close for reproduction and fill in solid. This system of shading may be adopted on a frustum of a cone, if the lines forming the shading do not converge too sharply. When the lines are run into the high light, and their edges softened by cross-hatching with white ink, the effect of a rounding surface is readily obtained, as shown in Fig. 49 (*f*). A cone may be successfully treated when the lines are run horizontally, or parallel with the base, as shown in view (*g*), and thickened as previously described.

46. Shading Spherical Forms.—When a sphere is represented with line shading, the location of the high light is the first thing to be considered. The black lines that terminate at this white spot are cross-lined with white, so that a soft blended edge is produced. These black lines may be made with a bow compass, spaced to form a flat tint as shown in Fig. 49 (*h*) and then thickened until the desired modeling is produced, as shown in (*i*). Frequently, only a portion of the shading toward the outer perimeter is made in this manner, the inner portion being drawn in with an irregular curve. The purpose of this method of placing the lines is to overcome the flatness caused by the small circles as they approach the center. In (*j*) is shown a ball shaded in this manner. A spherical surface may be shaded with horizontal lines, as shown in (*k*), the lines being put in to form a flat tint and then carefully thickened on one side so that each line tapers. A concave surface may be treated in a similar manner to get the shape.

47. Shading Surfaces of Mechanical Forms.—Mechanical subjects drawn in perspective often require shading of the various surfaces to bring out the forms and details more clearly. If the subject is drawn from a photograph so illuminated that the details are not clear, the artist may assume the light to come from another direction. A knowledge of light and shade is necessary when this is done, and from instructions previously given no difficulty should be experienced in determining the shapes of shaded surfaces and of cast shadows, which are very necessary in bringing out the forms in relief.

48. In Fig. 50 (*a*) is shown an illustration shaded with line tints and having the appearance of a wood engraving. This subject is composed of various geometrical solids or forms. The body of the device is a vertical cylinder surmounted by a horizontal cylinder, the curved end of which supports a part that is the frustum of a cone. The horizontal pipe at the bottom terminates in a rounded end, which represents a portion of a sphere, as also do the valve at its bottom and the round-headed screws. Flat surfaces also are seen at various places in the illustration. Every surface, when analyzed, will be found to represent some geometrical form, as the cylinder, the sphere, the cone, and the cube. The examples given in Fig. 50 (*a*), where the correct line shading of these geometrical forms has



(a)

(b)

FIG. 50

been shown, furnish information which will be useful in obtaining the desired effect in the rendering of perspective views of such a subject as shown in section at (*b*).

A sectional drawing that shows the interior arrangement of a mechanical device must sometimes be made. In Fig. 50 (*b*) is shown such a view of the device shown in (*a*). Here, the body is shaded to represent it as being cut in half, while the interior parts are shown in full, and are shaded to bring out the true form of the surfaces. The helical spring, the damper-like valve, and the needle valves are so rendered that the drawing at once conveys an idea of the arrangement of the interior parts, their forms, and their functions. Nearly every catalog of mechanical devices contains such drawings as are shown at views (*a*) and (*b*), Fig. 50. The data furnished by a manufacturer for these illustrations may be a photograph or the device itself for the outside view, while for the sectional view a blueprint, as employed in its manufacture, would be supplied, or the device itself may be used for reference.

MECHANICAL SHADING-FILM WORK

49. Shading Machine.—The shading machine was probably the first mechanical device made for transferring tints from a gelatin film to the surface of paper, metal plates, or lithographic stone. The films are made in a great variety of patterns. In Fig. 51 are shown specimens of the tints used for backgrounds and to represent a variety of textures. In Fig. 52 is shown an example of shading done with the shading machine. This device is almost indispensable in an engraving plant, as the cost of producing tints on certain kinds of work would be prohibitive without it. A book of specimens is furnished by the manufacturer and the tints may be selected by number. The size of the film is also given.

50. In Fig. 53 is shown an illustration of a shading machine. It consists of a rectangular frame *a* over which is stretched a gelatin film *b*, on the surface of which is a raised pattern which may be transferred with ink to the drawing paper. The machine is attached to a drawing board by two clamps *c c′*, which hold a wooden strip *d*, to which is attached the mechanism for adjusting the film. The film may be moved up or down by adjusting screws *e* and *e′*, and sidewise by the adjusting screw *f*. The frame is hinged at the points *g* and *g′*, so that the film can be lifted from time to time to observe the progress of the work.

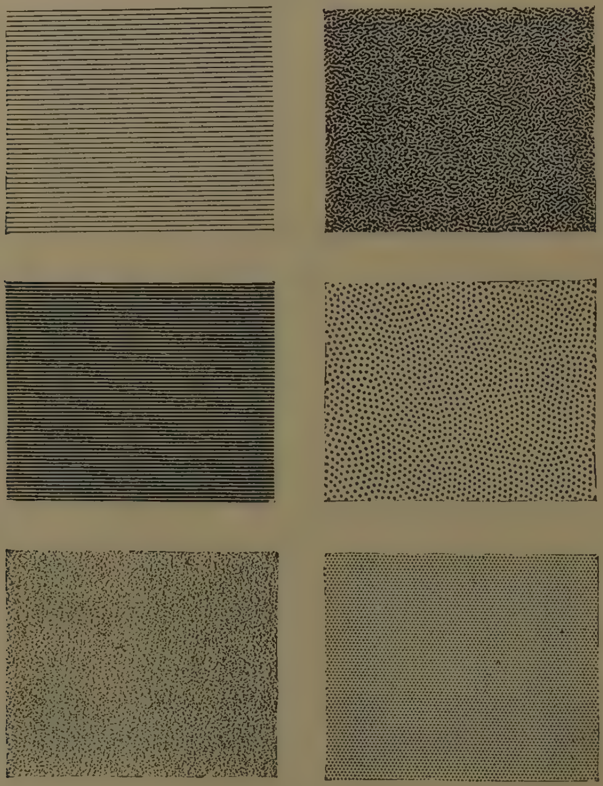


FIG. 51

51. Manipulation of the Shading Machine.—To prepare a film for use on a drawing, the film is laid on a felt pad, which fits the inside of the frame *a* and comes in contact with the smooth under surface afterwards to become the top

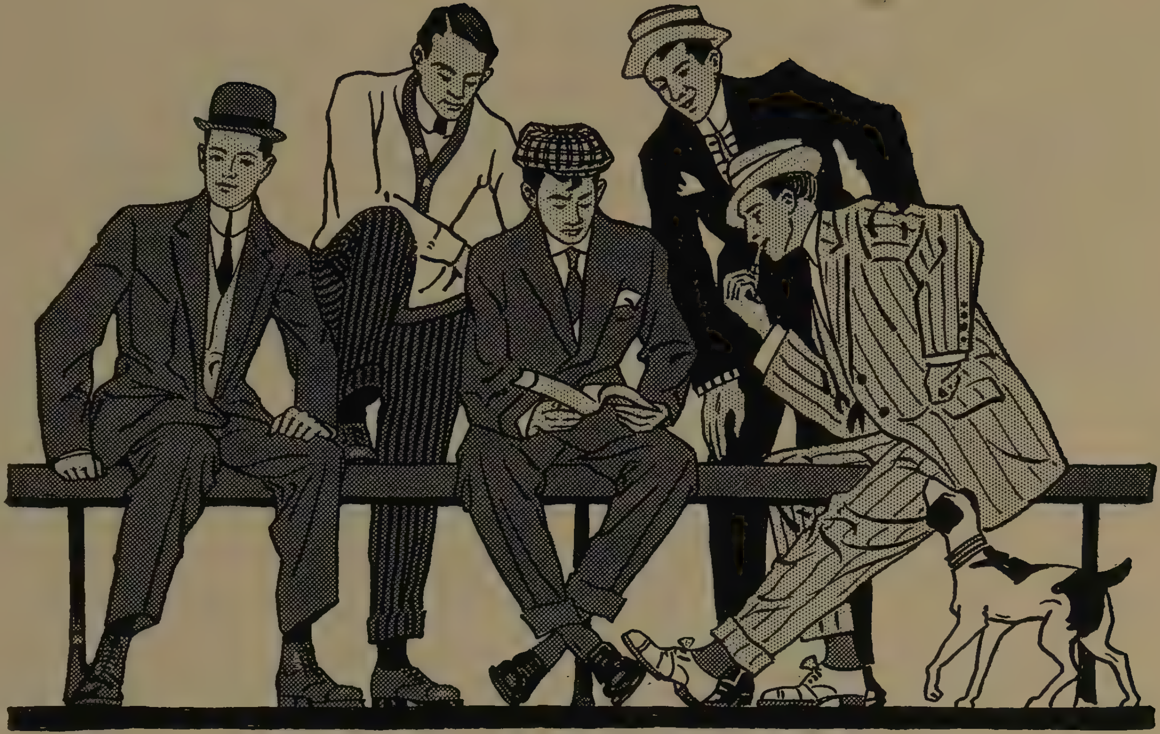


FIG. 52

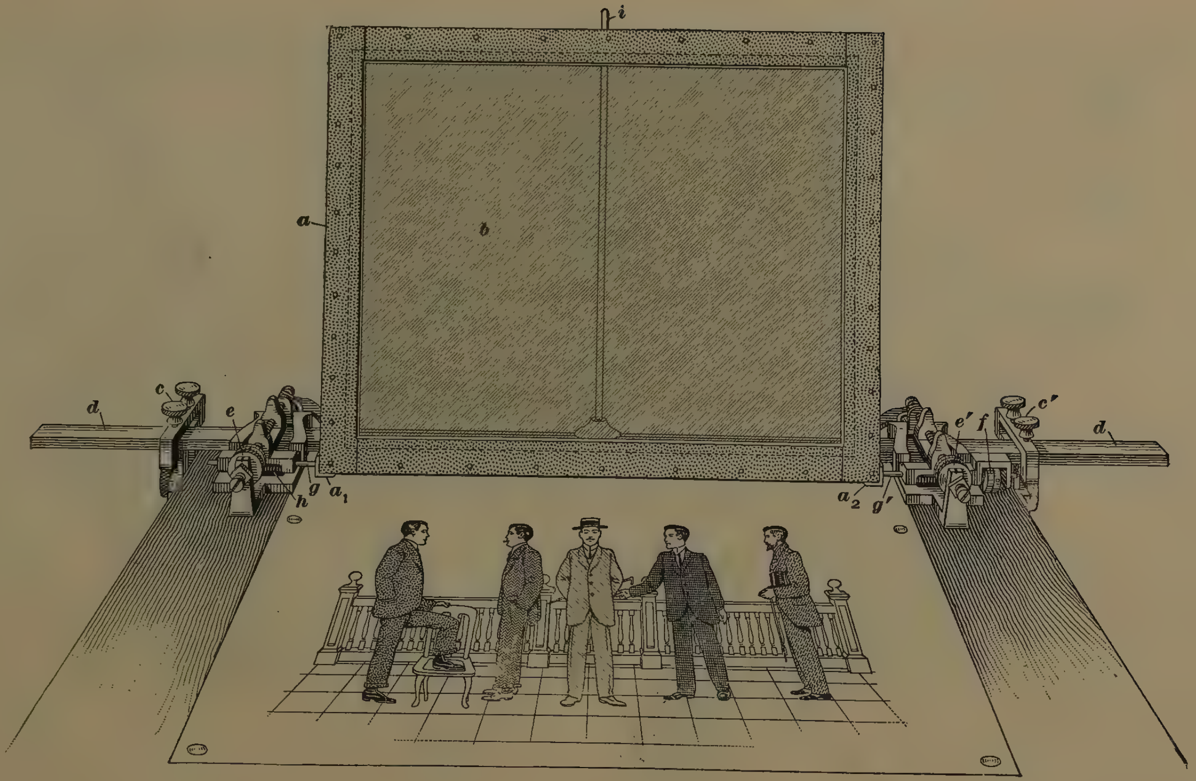


FIG. 53

surface of the film. The top surface, afterwards to become the under surface containing the raised tint that is to be transferred, is now inked with a printers' roller. To avoid heavy and muddy tints, the ink should be used sparingly; it must be thoroughly rolled out on a stone slab before it is applied to the film.

The frame with the film is now lifted from the pad and put in place, inked face downwards, by pressing the corner piece a_1 of the frame against the small rod g, which compresses a spring h and allows the corner piece a_2 of the frame to come against the point of the rod g'. The machine is now ready for transferring the tint from the film to the drawing. The vertical rod i is fastened to the rod d, and acts as a support for the film frame when it is raised.

The pattern is transferred to the drawing or the metal plate by rubbing the top surface of the film with an agate-tipped tool called a *stylus*, which is made of various sizes and shapes. For small surfaces and for working close to outlines, the straight-tipped stylus is best. A small rubber roller is used for large light- or medium-tone tints. If a slightly darker tint is desired, the film is lifted from the work and taken out by pressing the frame a to the left, thus forcing the rod g against a spring, when the frame may be released from the point of the rod g'. The film is again rolled up with transfer ink, lifted from the pad, replaced in the machine, laid carefully on the drawing, and tested. The film is then raised a little and adjusted by turning the screws e, e', or f sufficiently; then when the back of the film is rubbed a darker tint is produced.

The ink that has been transferred to the drawing is wet, but to prevent smudging it may be dried quickly by the use of powdered soapstone, which is sprinkled on the drawing and rubbed off carefully with a piece of absorbent cotton.

52. Using and Transferring Film Tints.—The film tints are more perfect when transferred to a smooth surface. A specially coated smooth chalk board, sometimes called *scratchboard*, is constructed for this purpose. Work on scratchboard is usually done with ruling pen and brush, as the surface would be scratched by the regular pen.

53. The shading machine is used extensively by lithographers on stone and for color work on metal plates. Its best work is done on stone or metal plates, these surfaces being perfectly smooth. Many methods have been devised for protecting that portion of the drawing on which no tint is desired. Some persons use tracing paper, cut out to the desired shape, to mask the parts, and others use a *frisket paper*, which has been treated with rubber cement, and which will be described more fully in connection with retouching for halftones. If the film is to be transferred to a silver print or metal plate, a solution of gum arabic and water, to which a little coloring matter has been added, will be found satisfactory for protecting parts. The addition of coloring matter to the transparent solution shows the parts that have been gone over. When putting a film tint over a silver print, the gum washes off when bleaching the print, leaving those parts white and free from the film tint. When a film tint has been put on a metal plate the ink lines or dots that have been transferred are wet, and powdered dragon's blood dusted over the surface will adhere to those parts. The plate is then heated, the powder melts and fuses with the transfer ink, and forms a resist for the acid. The plate may then be etched in the usual way described for line etching.

When the air is damp, the films should be handled very carefully, as they absorb moisture, and the pressure of the stylus on the back of the surface should be very light; otherwise, the tint is likely to be cloudy. The film should be cleaned with benzine after using. To keep films in good condition, they should be rubbed over occasionally with glycerine, which prevents cracking.

CHALK-PLATE WORK

54. Character of Plate, and Method of Working.—In localities where there are no facilities for making zinc etchings for newspaper work, the chalk-plate process can be used. A steel plate coated with a special chalk composition can be purchased, on which a pencil sketch may be made. The lines of the drawing are then cut down through the chalk to the steel plate with scrapers of various sizes. Several scrapings are generally necessary before the metal surface is reached. The chalk composition is brittle and breaks away on each side of the line; but sufficient chalk adheres to the metal plate so that the line that is being scraped is clean and sharp.

After all the lines of the drawing have been scraped to the metal plate, it is practically the same as a matrix and is used in the same manner. The chalk plate is placed in a cast-iron box and hot lead is poured on it, which fills in all grooves representing the lines of the drawing, and when the lead casting is removed a relief, or stereotype, plate is obtained, which must be trimmed by the engraver, and planed to the standard thickness, so that when mounted on a wooden block it will be type-high and will be ready for press.

This process is a quick makeshift used for crude work only, and is unpopular on account of the white dust produced when scraping. As facilities for procuring zinc etchings are now within the reach of most newspaper offices, the chalk-plate process is little used.

DRAWING EXERCISES FOR LINE ENGRAVING

GENERAL INFORMATION

55. Required Work.—The test drawings required in this Section are arranged to determine whether or not the student has become familiar enough with special commercial line techniques to be able to do work of that character. This test work will be an extension of the practice in commercial illustrating for line engraving already done.

As in the case of the previous subjects, the drawing work will consist partly of copying certain text illustrations for practice in technique and partly of the preparation of original drawings for commercial illustrating purposes, which will be executed in various special techniques, stipple, Ross-paper work, or shading-film work, etc., as specified.

All students are required to complete satisfactorily the first four plates. The last two are given so that those who may desire criticism on their work with Ross paper and the shading film may obtain it. Owing to the cost of Ross paper and the shading-film machine, the student is not required to procure them.

In all cases, however, the student must inform the Schools whether or not he intends making the optional drawings.

56. Character of the Plates.—The required drawings, as before, will be in the form of drawing plates. There should be no difficulty in keeping these plates of uniform size; say 10 in. × 15 in., or 10½ in. × 16 in., except in the case of Ross-paper work, where the size of plate must be influenced to some degree by the stock size of Ross papers. The prepared Ross papers or boards come in various sizes, one of the most convenient being 14 in. × 22 in., each sheet of which can be cut into four parts, which will make each one 7 in. × 11 in., which four could then be considered a plate and be mailed flat in an envelope (stiffened by cardboard). The drawings in stipple or in shading-film work could be made on linen ledger or bond paper, or on illustrators' board.

Before doing the work on any drawing plate, the conditions and requirements must be carefully read and understood, so that the drawing will be of proper size, proportion, etc. Reference should always first be made to the portion of the text where the preparation of the kind of drawing in question is fully discussed and illustrated.

PLATE 1

57. Exercise A, Plate 1.—In the upper left-hand rectangle of the 10½″×16″ plate, arranged vertically, make a very careful pen-and-ink copy of the line drawing of the fowl shown in Fig. 3. The size of the rectangle will allow the drawing to be made about twice the size of Fig. 3, and technique such as is used in Fig. 2 may be employed. Note carefully the kinds of lines to be employed on the various parts of the bird.

58. Exercise B, Plate 1.—In the upper right-hand rectangle of the plate, make an original pen-and-ink drawing of a fowl, or a group of fowls, suitable for an illustration in a poultry catalog or poultry magazine. First draw the pencil sketch direct from the fowl very carefully, then render it in pen and ink, using as far as practicable the special technique employed in Exercise A.

59. Exercise C, Plate 1.—In the lower left-hand rectangle of the plate, make a very careful pen-and-ink copy of the line drawing of the head of lettuce shown in Fig. 4 (*a*), enlarging the drawing, and the line technique, considerably so as to fit well within the prescribed rectangle. Note carefully the kinds of lines used to portray the curving and undulating surfaces of the leaves, using for this purpose (if desired) a reading glass.

60. Exercise D, Plate 1.—In the lower left-hand rectangle of the plate, make an original pen-and-ink drawing of some selected vegetable subject, first making a carefully shaded pencil sketch direct from the article, and then render it carefully with pen-and-ink lines of the general character of those shown in the text illustrations of vegetable subjects, and particularly as used in Exercise C.

61. Final Work on Plate 1.—Letter or write on the back of the plate the title, Plate 1: Drawing for Line Engraving, (Part 2), name, address, class letters and number, etc., and send to the Schools for examination. Then proceed with Plate 2.

PLATE 2

62. Exercise A, Plate 2.—In the upper left-hand rectangle of the $10\frac{1}{2}'' \times 16''$ plate, arranged vertically, make a very careful pen-and-ink copy of the line drawing of the raspberries shown in Fig. 8 (*a*), enlarging them to more nearly fill the available rectangle and using the technique as shown full size in (*b*). Note carefully the styles of strokes employed; the stippled effect of short strokes for the surface of the leaves, and the curving crisp black lines and masses used for the berries.

63. Exercise B, Plate 2.—In the upper right-hand rectangle of the plate, make an original pen-and-ink drawing of some berries, or small fruits, suitable for a catalog cut, or advertisement picture. First draw the carefully modeled pencil sketch, and then render it carefully in pen and ink, using suitable technique, as described and illustrated in the text, and as especially shown in Fig. 8 (*b*).

64. Exercise C, Plate 2.—In the lower left-hand rectangle of the plate, make a very careful pen-and-ink copy of the line drawing of the chair shown in Fig. 9 (*a*), enlarging it to fill the prescribed rectangle properly, and using the technique shown in (*b*). Study the technique carefully and endeavor to reproduce it faithfully.

65. Exercise D, Plate 2.—In the lower right-hand rectangle of the plate, make an original pen-and-ink drawing of a chair, table, bookcase, or other article of furniture, suitable for a catalog cut or advertisement illustration. First, make a carefully modeled pencil sketch direct from the article of furniture (or a photograph of it) and then render carefully in pen and ink, using suitable technique for furniture, as shown in Fig. 9 (*b*), and as used in Exercise C.

66. Final Work on Plate 2.—Letter or write on the back of the plate the title, Plate 2: Drawing for Line Engraving (Part 2), name, address, class letters and number, etc., and send to the Schools for examination. Then proceed with Plate 3.

PLATE 3

67. Exercise A, Plate 3.—In the upper left-hand rectangle of the $10\frac{1}{2}'' \times 16''$ plate, arranged vertically, make a very careful copy of the stippled drawing of the hand shown in Fig. 24 (*a*), enlarging it to about twice the size shown, and using the technique; that is, size and quality of stippled dots, as shown in (*b*). It should be noted that not all the dots are of the same size, nor are the larger and blacker ones perfectly round, but are irregularly shaped, as shown.

68. Exercise B, Plate 3.—In the upper right-hand rectangle of the plate, make a very careful copy of the stippled drawing of the head and shoulders of the man shown in Fig. 26 (*b*), enlarging it slightly to suit the prescribed rectangle, and using the general style of technique shown in (*b*). Note that the most delicate stippling is done on the face, and a somewhat coarser stippling of dots on the hat, and that the coat is rendered in short lines, placed at right angles to one another in a sort of herring-bone pattern.

69. Exercise C, Plate 3.—In the lower left-hand rectangle of the plate, make a very careful copy of the stipple-and-line drawing of the berries shown in Fig. 27 (*a*). Enlarge sufficiently to suit the space and render in the technique shown in (*b*). Note carefully that the berries are rendered in stipple work that blends into deep black, while the texture of the leaves is produced by short curving lines.

70. Exercise D, Plate 3.—In the lower right-hand rectangle of the plate, make a very careful copy of that portion of Fig. 28 showing the hand, the coin, and the lamp, with accompanying background. Enlarge this portion so that it is on about the same scale as shown in Fig. 29, so as to fit conveniently into the rectangle, and render with the technique shown in Fig. 29. Note that the stippling on the hand is composed of short worm-like lines in irregular stipple formation, and that the background is a solid black relieved by a stipple of white dots.

71. Final Work on Plate 3.—Letter or write on the back of the plate the title, Plate 3: Drawing for Line Engraving, (Part 2), name, address, class letters and number, etc., and send to the Schools for examination. If all required work on previous plates has been completed, proceed now with Plate 4.

PLATE 4

72. Exercise A, Plate 4.—In the upper part of the plate arranged vertically; that is, in a space about $10\frac{1}{2}$ in. × 8 in., prepare a specimen of a spatter-work drawing. This drawing should not be a copy of Fig. 35, which figure is introduced simply to show how the mask or stencil is used, but should be an original pictorial sketch, part of which is treated in spatter work. Among the subjects suggested is a street scene on a rainy day or in the evening, with such background as cloudy or twilight-covered sky being shown in spatter work. This or any selected scene may be drawn, and part of it shown in spatter work.

73. Exercise B, Plate 4.—In the lower half of the plate make a very careful copy, twice the size, in mechanically drawn pen-and-ink lines, of the mechanically-shaded solids shown in Fig. 49. For this work, the ruling pen and the bow-pen (from a standard set of drawing instruments) are required. If the student is not already provided with such instruments he should secure them, either purchasing or borrowing them, in order to do this work. The greatest exactness is required, especially in inking the curved lines on the spherical forms, one set being allowed to dry before adjacent ones are drawn. An effort should be made to execute the work with as great exactness as shown in Fig. 49, except that the drawings are to be twice the size of those shown in the illustration.

74. Final Work on Plate 4.—Letter or write on the back of the plate the title, Plate 4: Drawing for Line Engraving, (Part 2), name, address, class letters and number, etc., and send to the Schools for examination. If all required work on previous plates has been completed, proceed now with Plate 5, if it has been decided to do Plates 5 and 6. If the optional plates are omitted, the required work in this Section has been completed, and the next Section should be taken up at once.

PLATE 5

NOTE.—The work on this plate is optional.

75. Exercise A, Plate 5.—On a piece of Ross paper about 7 in. × 11 in. (one-fourth of a 14″×22″ sheet) prepare the four squares of practice exercises shown in Fig. 40 (*a*), (*b*), (*c*), and (*d*), using lithographic crayon and working as directed in the text. The squares of practice work should be about twice the size of those shown in the illustration.

76. Exercise B, Plate 5.—On a 7″×11″ piece of Ross paper, make very careful copies in lithographic crayon, twice the size, of the apple in Fig. 44 and the strawberry in Fig. 45, working in the method directed in the text.

77. Exercise C, Plate 5.—On a 7″×11″ piece of Ross paper, make a very careful copy in lithographic crayon, twice the size, of the chair in Fig. 38, working in the method already practiced in Exercises A and B.

78. Exercise D, Plate 5.—On a 7″×11″ piece of Ross paper, make a very careful copy in lithographic crayon, twice the size, of the landscape shown in Fig. 37, making the landscape arranged as a vertical panel to more nearly suit the 7″×11″ size of the Ross paper.

79. Final Work on Plate 5.—Letter or write on the back of each one of the 7″×11″ sheets (the four constituting Plate 5), the title, Plate 5: Drawing for Line Engraving, (Part 2), name, address, class letters and number, etc., and send the four sheets (mailed flat) to the Schools for examination. If all required work on previous plates has been completed, proceed with optional Plate 6.

PLATE 6

NOTE.—The work on this plate is optional.

80. Exercise A, Plate 6.—In the upper half of the plate arranged vertically; that is, in a space about $10\frac{1}{2}$ in. × 8 in., make a very careful copy of the advertisement drawing shown in Fig. 52, drawing it first in outline, and then rendering the tone masses in shading-film work as shown. The drawing is to be twice the size of the illustration in the text.

It is understood, of course, that this exercise is not to be prepared unless the student has access to a shading machine.

81. Exercise B, Plate 6.—In the lower half of the plate, prepare an original commercial illustration for a newspaper or magazine advertisement, and render parts of it with shading-film work so as to make it attractive. The character and size of the original illustration are left to the judgment of the student.

It is understood, of course, that this exercise is not to be prepared unless the student has access to a shading machine.

82. Final Work on Plate 6.—Letter or write on the back of the plate the title, Plate 6: Drawing for Line Engraving, (Part 2), name, address, class letters and number, etc., and send to the Schools for examination.

If any redrawn or rerendered work on any of the plates of this Section has been called for and has not yet been completed, it should be satisfactorily finished at this time. After all required work on the plates of this Section has been completed, the work of the next Section, in which the training in commercial illustrating is continued, should be taken up at once.

RETOUCHING FOR HALFTONES

(PART 1)

INTRODUCTION

PURPOSE

1. Commercial Illustrations in Halftone.—A very large proportion of illustrations used in catalogs and advertisements require that the article or goods shall be portrayed with a greater degree of realism than the line engraving, or shall more closely imitate a photograph. Such photographic realism is secured by the **halftone process** and the printed pictures so produced are termed **halftones.**

While photographs and paintings of every description are made to be reproduced by the halftone process, so large a proportion of the commercial-illustrating work done for halftones consists of the retouching of photographs that retouching work will be chiefly discussed, both in this and the following Section. The preparation of illustrative drawings and paintings, rendered with pigments and brushes, will also receive due attention.

2. Method of Conducting the Training.—First, there will be given a description of the method of preparing halftone plates from drawings, paintings, and retouched photographs. It is not the intention, however, to describe this process in a very technical manner but sufficiently in detail to give the student a general idea of the method employed, so that he may see the reason for preparing in a certain way the drawing, painting, or retouched photograph to be reproduced. Next, will follow

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a classification of the various types of illustrations that require the halftone process for their proper reproduction. Then will be given a description of the air brush, its construction and operation, especially the repainting or retouching of photographs for the halftone process. In the following Section will be presented various types of commercial illustrations, catalog and advertisement illustrations, portraits, etc., all for halftone reproduction, and also a description of the retouching of photographs. An important reason for giving this description will be evident when drawings are required that are to be printed from several plates in two or more colors of ink. This class of work will be described in a Section devoted to drawing for color reproduction, which is also done by the halftone process.

HALFTONE PROCESS OF REPRODUCTION

MAKING THE PLATE

3. Photographing the Drawing.—The halftone process is a method of photoengraving by which printing plates may be made from line and wash drawings, gouache and water-color drawings, oil paintings, photographs, and sometimes from the objects themselves. For catalogs, magazines, and trade papers, its rapidity and economy commend the halftone process to the publisher and advertiser. A wash drawing or photograph with good contrast is the basis of a good halftone plate.

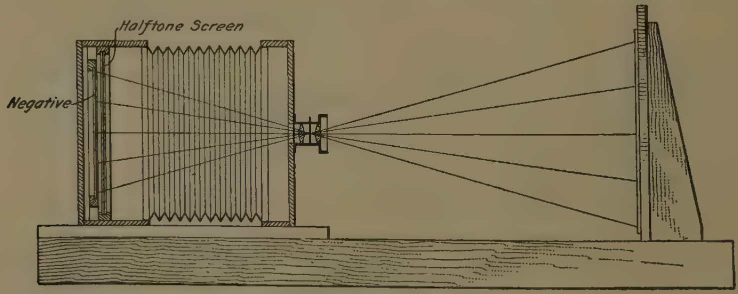


FIG. 1

A wash drawing or photograph to be reproduced is fastened to a copying board and photographed with the same type of camera as is used for line engraving, with the exception that the plate holder is made to hold the wet plate, or negative, and a ruled screen. The ruled screen occupies a position close to and in front of the sensitive wet plate, or negative, so that the light passing through the lens goes through the ruled screen before it affects the sensitive plate, as in Fig. 1. In the more modern types, the screen is retained in the camera instead of in the plate holder, and a device is provided to shift the screen closely to the negative, after the plate holder is placed on the camera. The principle and the results obtained, however, are the same.

An essential to success in halftone making is the uniform lighting of the copy; therefore, an arc lamp is placed at each side of the camera. Another advantage in using arc lights of a certain intensity is that the photographer can more easily judge the exposure, and thus save time and material. Large drawings are sometimes illuminated by daylight; but the greatest success in process work is obtained with artificial light.

4. Halftone Screen.—The ruled screen can best be described by comparing it to an ordinary wire screen, except that it is ruled on glass. The lines are equally spaced and the rulings on commercial screens vary from fifty to two hundred lines to the inch. The lines are crossed at right angles, forming squares.

Only solid blacks and whites in defined relation can be reproduced in photoengraving. When the problem is to take a photograph or wash drawing, with all the delicate gradations, and produce a plate in relief to print on an ordinary printing press, the ruled screen is placed between the sensitive plate and the lens to break up the picture into dots of various sizes on the sensitive wet plate; this is done by the light rays reflecting from the picture through the lens and passing through this ruled screen. The finest dots in the negative represent the darkest portion of the picture, gradually becoming larger when representing the medium tones; in approaching the lightest part of the picture, the dots run together and overlap so that only the smallest white specks are visible between them on the negative. The space between the screen and the sensitive plate may be so adjusted as to regulate the diffusion of light through the screen and secure the necessary contrast. *Diaphragms*, or thin pieces of blackened metal, placed in a slot in the lens casing, in which holes of various shapes have been cut, are used to regulate the diffusion of light so that certain shaped dots may be formed and also to effect the amount of contrast. Thus, the varying sizes of the little black dots on the negative represent the

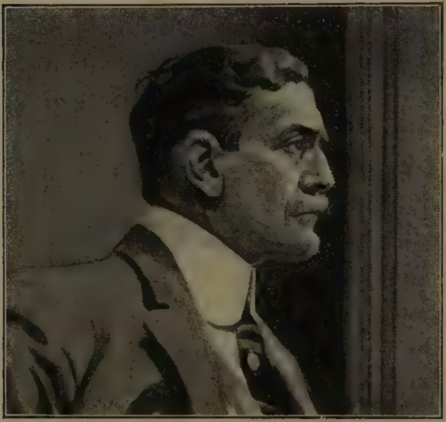


FIG. 2

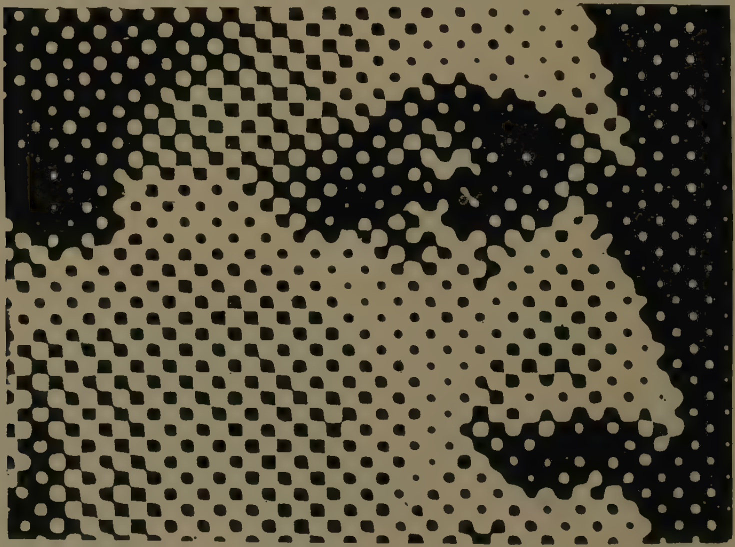


FIG. 3

varying values of the drawing, painting, or photograph. These dots of reduced silver are left after the negative has been developed; all portions between the dots show clear glass, as they have received no light; hence, the silver in these parts deposits in the fixing bath when the negative is being developed by practically the same process as that used for line negatives.

In Fig. 2 is shown a halftone reproduction made from a wash drawing, using a screen of 120 lines to the inch. Fig. 3 is a magnified portion of this halftone, showing more clearly how the dots vary in size from the finest dot in the light shades until, as the darker shades are approached, they become larger and finally combine or overlap, leaving very fine white dots between them. In Fig. 4 is shown a magnified portion of the *negative;* that is, the image on the photographic plate, from which the halftone was made, in which, of course, all details are shown reversed both in position and in black and white value.

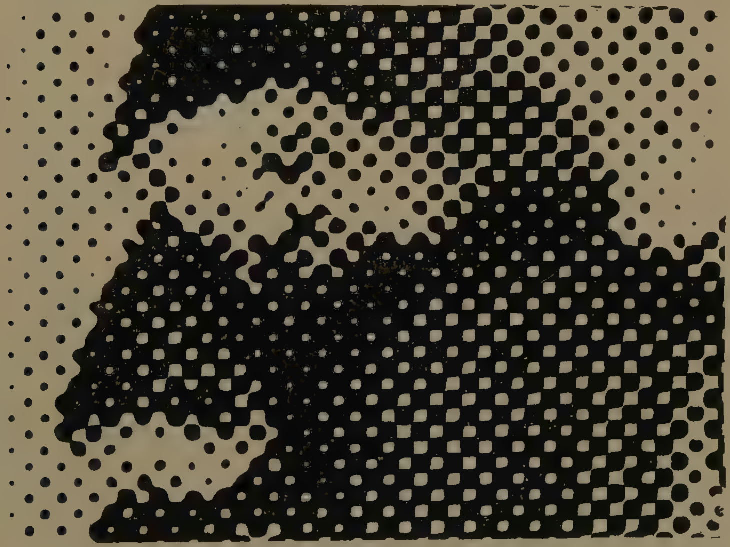


FIG. 4

5. Developing the Negative.—The wet plate, having been exposed in the camera, is developed and intensified in the dark room. The resulting negative is then dried, coated with rubber and collodion, and turned in the manner described for line negatives, unless a prism has been used to reverse the image.

6. Preparing the Copper Plate.—A piece of polished copper is coated, in the dark room, with a sensitizing solution composed of water, refined fish glue, and bichromate of ammonia. An even distribution of the solution over the polished copper plate is assured by whirling the plate rapidly while drying it over a gas stove; the enamel thus formed is sensitive to light. The copper plate is then placed in a printing frame in contact with the halftone negative and exposed to sunlight or electric light. After the exposure, the frame is taken to the dark room, where the copper plate is carefully removed. The appearance of the image is difficult to determine from the clear and transparent enamel, so the image is made visible during development by dipping the plate in a brilliant red dye.

After the copper plate has had sufficient exposure to the light and has been developed properly, all parts showing clear glass on the negative have allowed the light to act on the sensitive enamel on the copper plate, which is thereby hardened; hence, when the copper plate is placed in the developing bath, all parts that have received no light wash away. The resulting copper plate then shows enamel dots and between them the unprotected copper. Alcohol is then poured over the copper plate, which is held with tongs over a gas stove and the enamel image heated until it assumes a dark brown or black color, becomes hard, and resists the acid when etching.

7. Etching the Plate.—Next, the back of the plate is coated with asphalt varnish to prevent the acid attacking it. The copper plate is now immersed in an acid tray containing an etching solution composed of perchloride of iron. If the plate is placed in the tray face up, all sediment arising from chemical action on the metal is removed with a brush. Some etchers place the plate, supported on blocks, face down in the solution, so that all sediment deposits directly in the tray. After the plate has been sufficiently etched, it is taken from the tray, washed, and dried. The asphalt varnish is then removed from the back of the plate with turpentine. The plate is now what is termed a *flat etch*. If a square finish with a fine line around is required, it is put on the plate with a lining machine. The plate is now proved on a hand press, and the plate and proof given to the finisher, who compares the proof with the original copy. Where the proof appears too gray, the plate must be reetched or *fine etched*, by painting the darker and middle tones with asphalt varnish and again immersing the plate in the acid tray for a short period. The plate is cleaned and proved again, and if it still requires treatment, the operation is repeated, or the parts are treated locally by the etcher, who applies the acid with a brush and removes it with a wet piece of absorbent cotton as soon as the etching has gone far enough. The halftone is then examined with a magnifying glass and the operation repeated until the dots are small enough to produce the desired shade when printed.

8. Reetching the Plate.—High lights are obtained by painting over certain parts with asphalt varnish to protect them from the acid and the halftone plate is again immersed in the acid tray until the dots of the screen, which are to be the high light, have been entirely etched away. Another method of producing high lights is to cut the dots away with an engraver's tool.

9. Finishing the Plate.—Even after reetching, a halftone plate may lack brilliancy or snap, so the operator darkens portions of it by rubbing a tool, called a *burnisher*, over its surface. This action not only enlarges the black dots in the medium-gray tones of the plate, but closes in the small white dots in the dark portions, thus producing darker tints and solid black. This will be seen by referring to Fig. 2, where the solid black part in the hair was produced by burnishing the plate. The burnisher must be used very carefully, so the surface will not become uneven and the printing quality of the plate be spoiled. The student should endeavor to visit an engraving establishment and watch the operations of etching and finishing plates.

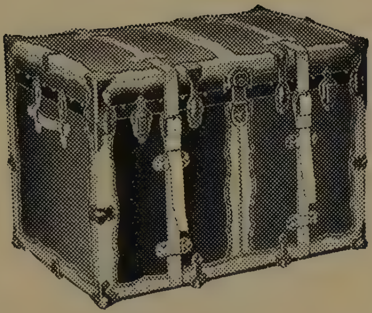
HALFTONE SCREENS

10. Screens Suitable for Different Papers.—As ruled screens are made of from 50 to 200 lines to the inch, when ordering an engraving judgment should be used to select a screen of the proper ruling, which depends on the grade of paper on which the engraving is to be printed and on the detail in the picture. It is to be understood, of course, that the effects of various kinds of screens must be fully understood by the artist, so that he can draw or paint properly for them.

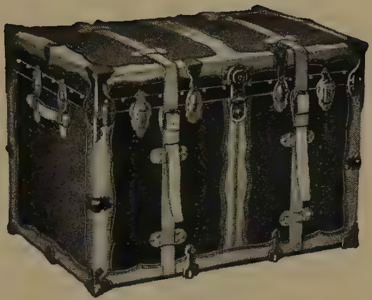
For printing on cheap news paper, the screens mostly used range from 50 to 85 lines per inch. Newspaper halftones are usually etched on zinc, the process of obtaining the image being the same as when copper is used. This metal etches more quickly than copper and the coarse screens used allow this class of work to be rolled up and powdered to obtain a deeper etching, in a similar manner to that used for line etching; but this process could not be adopted where finer screens are used, as the rolled ink and powder would get between the dots and fill in the shadows before sufficient depth had been obtained in etching. For high-grade work, copper is the best material, on account of its fineness of grain and its superior wearing and printing qualities.

11. Screens for Various Purposes.—For newspapers that use the best grades of news paper, and where the printing is direct from the halftones, a 100-line screen may be used. The 120-line screen is suitable for printing on paper having a machine finish. For higher grade printing, such as that of high-class magazines, trade papers, catalogs, booklets, etc., halftones are made, using a screen of 133, 150, 175, and sometimes 200 lines to the inch, according to the quality of the paper and the detail required in the plate. The 120-, 133-, and 150-line screen halftones are employed in the greater proportion of the general magazines; in the highest class, the 175-line screen is often used.

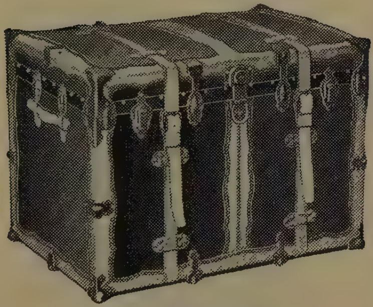
In Fig. 5 is shown an illustration reproduced in halftone, using the various screens ranging from 65 lines to 200 lines to



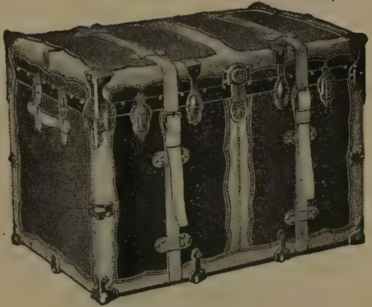
Screen No. 65



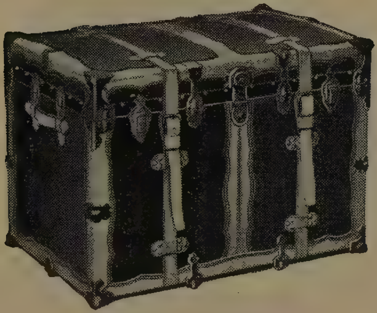
Screen No. 133



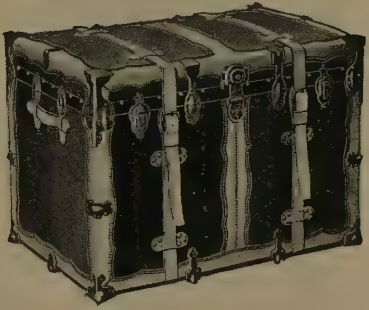
Screen No. 85



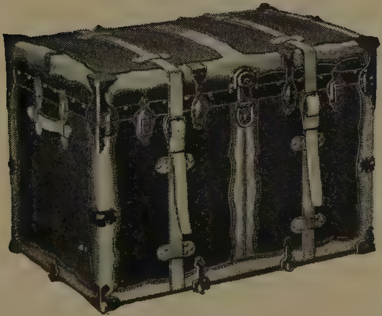
Screen No. 150



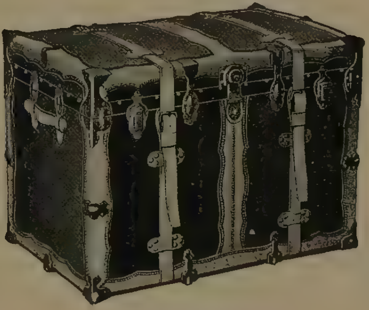
Screen No. 100



Screen No. 175



Screen No. 120

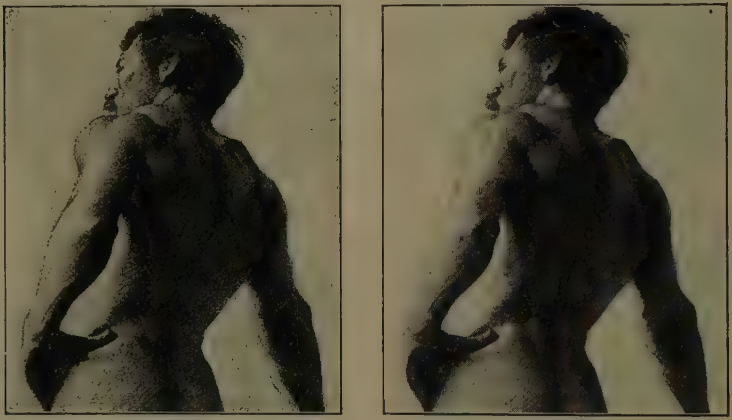


Screen No. 200

Fig. 5

the inch. In commercial work, halftones with a finer screen than 150 lines are seldom required. Finer screens, as a rule, cannot be electrotyped successfully, particularly when the subjects are vignetted. If the subject demands a very fine screen it is best to print from the halftone direct. The finer the screen, the more true to the copy will be the finished result, as the dots of the halftone are practically unnoticeable.

12. Mezzograph Screen.—The mezzograph screen was designed to supersede the mechanically ruled halftone screen as a means of expressing the values of the wash or body color drawing, photograph, or object. For fine art work, the mezzograph, if properly done, rivals the halftone and for certain subjects is undoubtedly superior. The sharpness obtained by the mechanically ruled screen, however, finds favor with the average advertiser, as mechanical subjects are best reproduced by that method. Figure subjects drawn in crayon or charcoal may be portrayed more correctly by the mezzograph screen which, being free from straight lines, interprets the flesh tints better. In Fig. 6 (*a*) is illustrated a specimen reproduction, using the mezzograph screen, which shows the texture to be composed of fine irregular dots forming a grain. In (*b*) is shown the same subject reproduced with a halftone screen.


(*a*) FIG. 6 (*b*)

The mezzograph screen is particularly useful in connection with color-plate printing, as a substitute for the shading machine, Ross board, and other flat zinc plates in color work, as its irregular grain does not form a pattern when printed in conjunction with halftone plates, as is often the case when halftones only are used. In color printing, the key plate, or darker colors, are best represented by the mechanical halftone screen, as the mezzograph screen is too delicate, but it softens the hardness of the halftone screen. This point will be fully discussed later when drawing for color reproduction is taken up.

13. The **mezzograph screen** may be considered as composed of an infinite number of irregular-shaped lenses of very short focus. The ordinary halftone screen is composed of ruled lines cut in glass, which are darkened with a black pigment; but the mezzograph screen has no coloring matter placed in the grained surface to assist the diffusion of light. To get the proper diffusion the screen must be placed very close to the sensitive plate and the exposure must be short, or these small lenses lose their power of refraction. The work must be done by a skilful and experienced operator. The plates made with this type of screen should be printed on a good coated enamel paper, or the result will be a fuzzy, uneven, and spotty illustration. Halftone and mezzograph plates may be duplicated by electrotyping, and the best results are obtained by the recently perfected lead-molding process.

ELECTROTYPING

14. Doctor Albert Electrotyping Process.—An electrotype practically equal in quality to the original engraving is produced by the Doctor Albert lead-mold process of electrotyping, now in general use for duplicating halftones. Its main advantage over the older method is in making the impression from the original plate in sheet lead instead of wax, thus securing a more perfect mold.

15. Description of Process.—A sheet of carefully flattened lead, free from all imperfections, is cleansed with alcohol, dried, and polished with blacklead or graphite. The halftone plate, also polished, is then pressed into the surface of the polished sheet lead by a hydraulic molding press which produces a uniform pressure. Care must be taken to see that the pressure is just sufficient to force the halftone into the surface of the sheet lead to the exact depth of the etching; otherwise, the dots of the mold will be destroyed. A steel frame or other device, placed around the edges of the sheet lead, prevents the lead from spreading and thus spoiling the mold.

After the impression has been taken in the sheet lead, the sheet of lead may be suspended with a piece of wire in the bath and receive a deposit of copper on its surface, as previously described. The back of the sheet-lead mold, as well as the margins extending outside the halftone impression, may be protected from the copper deposit by wax or other medium. When a copper shell of the desired thickness has been obtained on the mold, it may be stripped off, backed in the usual way with electrotype metal, and planed to a standard thickness. The mold may be used again, as it is not destroyed when the copper shell is removed. The surface of the electrotype may be coated electrically with a steel or nickel facing, which permits longer runs of presswork.

STEREOTYPING

16. The process of stereotyping, as described in line work, may be successfully used for the reproduction of halftone plates where particularly fine results are not required. The process is employed for coarse, open, halftone work such as newspapers use, and halftones of 50, 65, and 85 lines to the inch are the finest from which good results may be obtained.

DESIGNING AND DRAWING COMMERCIAL ILLUSTRATIONS IN HALFTONE

MATERIALS AND METHODS OF WORK

17. Materials Required.—The materials most suitable for doing good work in pencil, charcoal, crayon, pen and ink, wash, gouache, water colors, oil colors, and pastels (all of which may be employed in making drawings for halftone reproduction) have been freely used by the student. He is also familiar with the supplementary instruments and devices used in commercial art rooms and drafting rooms. The chief device, therefore, with accompanying materials, to be described in this Section is the air brush.

While experience has been had in working in most of the mediums used for pictorial work, certain requirements, when using these common materials and mediums, must be observed when drawing or painting for process reproduction, especially when retouching photographs with the air brush. These requirements will be fully discussed in connection with drawing and designing illustrations in halftone, the classification of such illustrations, and particularly in connection with retouching with the air brush.

CLASSIFICATION OF COMMERCIAL ILLUSTRATIONS IN HALFTONE

18. Wide Range of Originals for Halftone Work. Halftone plates can be produced from a great variety of originals, any of which may possess any value, varying from pure white to the deepest shadow. The intermediate values, or halftones, are essential to the picture, and because these tints are retained in the plates, the process has been termed *halftone engraving*. Halftone engravings can be made from line and charcoal drawings, wash drawings, water-color paintings, photogravures, lithographs, steel engravings, photographs, etc., or direct from the object itself. In reproducing anything having colors, a photograph is taken, which then serves as the original from which the halftone is made. Probably more halftones are made from photographs than from any other form of copy.

19. Halftones From Pencil, Charcoal, and Crayon Drawings.—Halftones can be made from line drawings of various kinds, pencil, charcoal, crayon, etc., when they are required for special purposes, such as unique, attractive, advertisement illustrations, or special decorative magazine and book illustrations.

If the pencil or crayon drawing is used as a halftone without employing a light wash background, the result is often a fuzzy and weak halftone plate, and the engraver usually has trouble in reproducing the drawing. In Fig. 7 is shown an example of a halftone reproduction of a crayon drawing on which the proper background of wash was used. A careful study will show the general direction of the crayon lines, and how the flat background was washed in. The cut is vignetted all around and tooled at places in order to secure the broad sketchy effect in the reproduction.

20. Halftones From Pen-and-Ink Drawings. Although pen-and-ink drawings are primarily intended for reproduction by the line-engraving process, they are purposely reproduced by the halftone process, for certain special uses, such as magazine advertisements and other publicity work. The effect is that of a pen-and-ink drawing made on a light gray background, the halftone screen furnishing the background tint. A picture so produced is less sharp and hard in its lines and values than is the average line cut of a pen-and-ink drawing. For purposes of reproduction in halftone, drawings made with line mediums do not give the best results, because the paper upon which such drawings are made cannot be thoroughly covered by the medium used. That is, the grain of the paper causes minute white spaces to show through the tints, unless a stomp has been used in blending, and these minute spaces

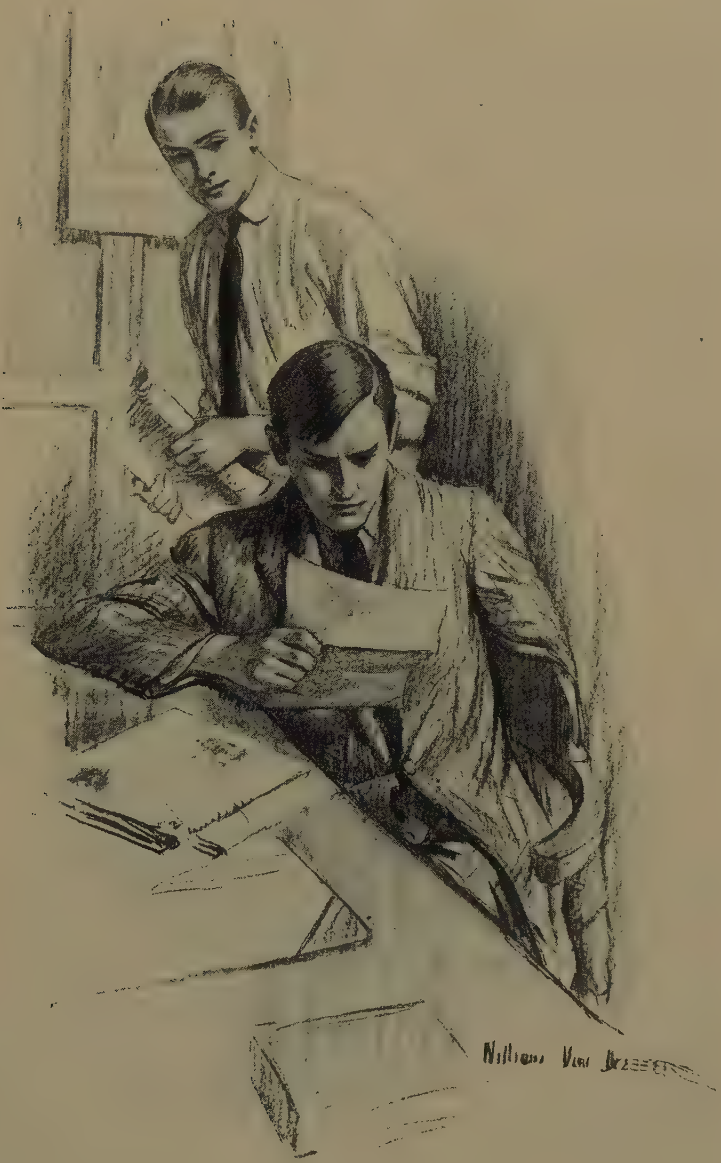


Fig. 7

break up the symmetrical arrangement of the halftone dots, with the result that the plate appears patchy and weak. When pen drawings are reproduced in halftone, the direction of the lines often causes a pattern, where they are crossed by the screen, rendering the result unsatisfactory. Where an outline pen drawing is to be broken up so the lines will appear gray, the method may be used to advantage.

21. Halftones From Wash and Gouache Drawings. Aside from those made from retouched photographs, most halftones are made from wash and gouache drawings; these drawings, consisting of graded values, cannot be reproduced by any other photoengraving process. For halftone work, wash drawings may be said to include any wash drawing made in one color. It need not be a black-and-white wash, but may be in brown, or in sepia, etc., and the light and dark values of those hues. To get good results, strong contrasts should be used. In this way snap and artistic quality are given to the rendering, and a better halftone results.

22. Similar drawings made with these mediums, but with the addition of opaque white, known as "distemper," or gouache, are also largely used. Wash and distemper drawings should be made clean and crisp and contain brilliant high lights. The most satisfactory results are obtained in halftone reproduction when drawings are prepared in this manner. In Fig. 8 is shown a reproduction made from such a drawing, the high lights in certain places having been produced by tooling. The size of the original drawing was 18 in. × 24 in. In Fig. 9 is shown a detail of this same drawing reproduced the actual size, so that the method of treatment may be seen. Wash drawings should be treated in a broad bold style such as shown in Fig. 9; the washes should be put on as near the strength of color desired as possible, and should be left undisturbed and allowed to dry before others are added. This treatment requires considerable experience, but the result obtained makes the very best copy for reproduction. Wash drawings should not be prepared on paper having a very rough surface, particularly when the reduction is slight, as the textures of the paper will show in the

Fig. 8

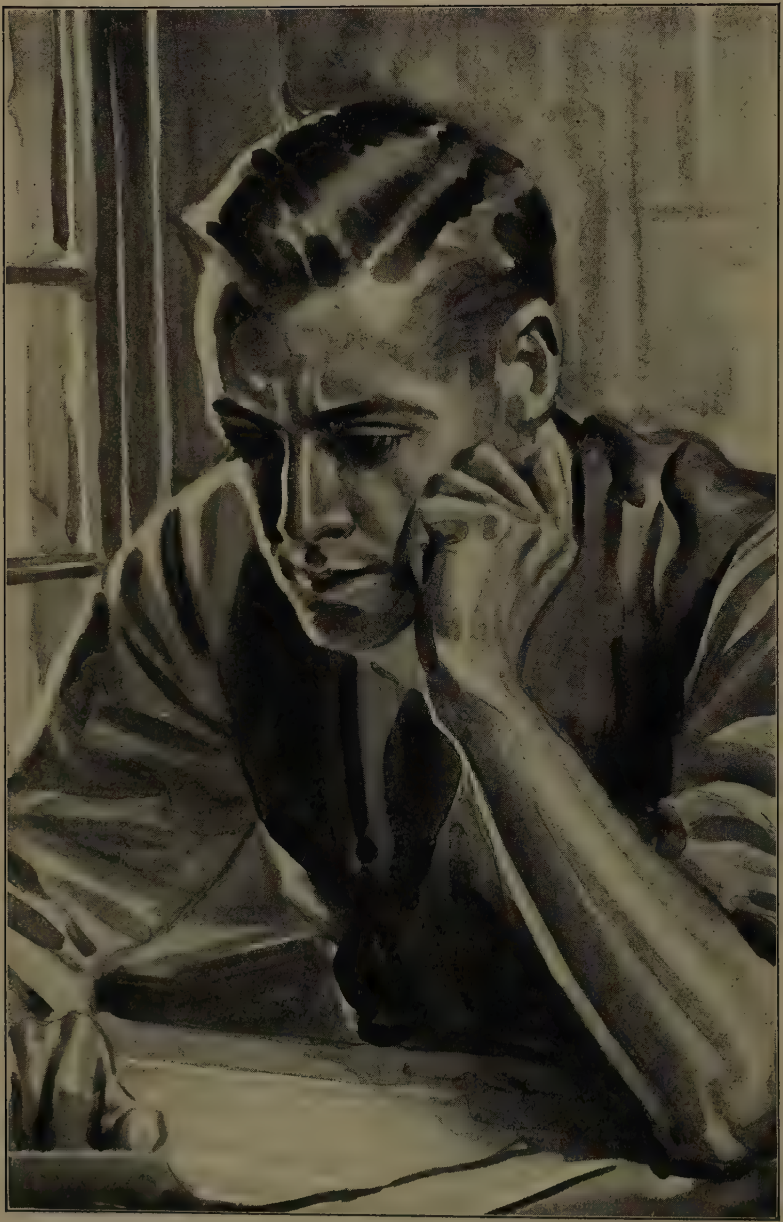


Fig. 9

halftone reproduction. Sometimes wash drawings are worked over with crayon, which, if done with definite strokes, will produce a drawing that will have a more free and sketchy appearance.

23. Halftones From Water-Color, Oil-Color, and Pastel Drawings.—Reproductions of water-color, oil-color, or pastel drawings can be made only in halftone. They are not always satisfactory originals, owing to the difficulty of reproducing the colors in their proper values. Thus, red when photographed will be nearly black, while blue will appear as a light gray or white. The use of orthochromatic plates will remedy this defect to a certain extent; but the most satisfactory result is obtained by carefully retouching a photograph of the painting so the color values may be corrected before the plate is made. The matter of preparing drawings or paintings for reproduction in color will be discussed in detail in a later Section.

24. Halftones Direct From Objects.—Halftones may be made direct from objects provided the object is nearly flat, so that all its visible parts can be brought into focus. For instance, halftones can be made direct from gold and silverware, jewelry of all kinds, gloves, buttons, combs, and other articles of merchandise; but a better course is to make ordinary photographs and then retouch them. Otherwise, insufficient contrasts of lights and darks in the originals cannot be corrected, or suitable backgrounds added, or necessary alterations made.

25. Halftones From Retouched or Repainted Photographs.—By far the greatest number of halftones in commercial work are made from retouched photographs. The importance of this work is such as to entail special detailed treatment, which will now be taken up.

RETOUCHING WITH THE AIR BRUSH

THE AIR BRUSH AND ITS OPERATION

26. Development of Air-Brush Retouching.—The amount of laborious and tedious handwork formerly required to prepare a photograph or wash drawing for the engraver's use, has been greatly reduced by the air brush. Its employment was formerly confined to coarser grades of work, such as crayon portraiture, show-cards, etc. By gradual improvement, the air brush became adapted to the finer grades of art work, as retouching of photographs and wash drawings suitable for reproduction by the photoengraving process. The instrument was not operated properly at first and the spray became coarse, resulting in a spotty reproduction. The photographer, also, did not thoroughly understand the proper method of lighting the copy, which exaggerated slight imperfections. A new class of artists was developed, skilled in the use of the air brush, and generally known as *photo retouchers*. Such photo retouching must not be confused with the retouching work done by the average commercial photographer, the latter work consisting in working with lead pencil or knife on a negative.

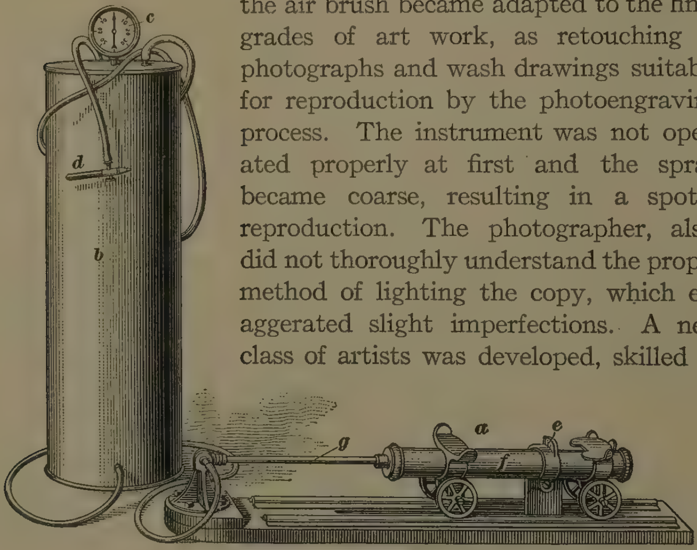


FIG. 10

27. The air brush operates somewhat on the principle of an atomizer. The action of compressed air, in passing the outlet of the color supply tube, creates a partial vacuum therein, draws out color, and forces it through a nozzle in the form of

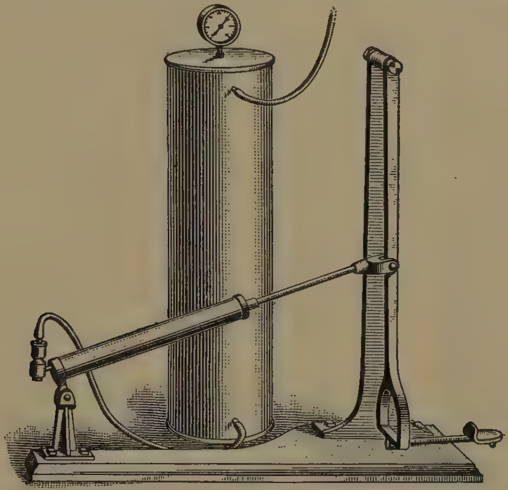


FIG. 11

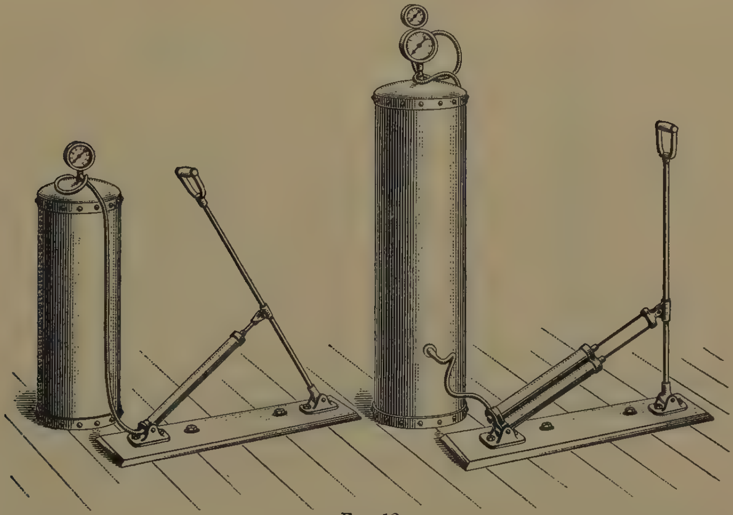


FIG. 12

fine spray. The air brush has been perfected to such an extent that, if properly adjusted, an almost clearly defined line can be made with it; the spray can be distributed and graduated from an almost invisible tint to a solid color. Much time is saved by its use, and a higher grade of work is turned out by the artist than was formerly done by the cleverest men who handled an ordinary sable painting brush.

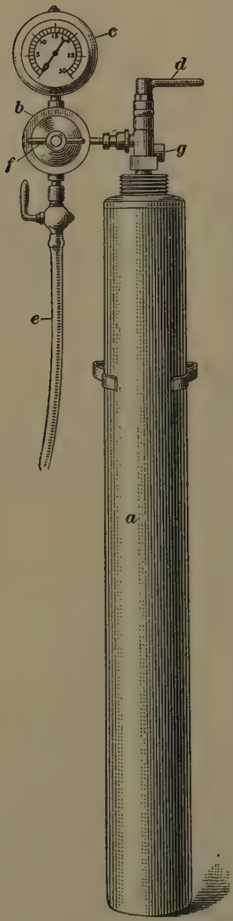


Fig. 13

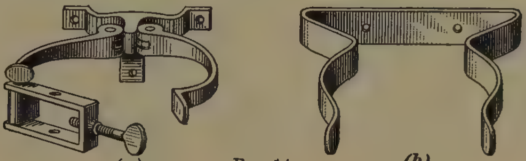
Most engraving plants are now equipped with the air-brush apparatus. While the air brush is a useful and almost indispensable instrument, the student should not rely entirely on it, but should be able to paint with color by hand any small parts that are required.

28. Apparatus for Compressed Air. A simple air-brush equipment, shown in Fig. 10, consists of a pump *a*, tank *b*, gauge *c*, and the air brush *d* that produces the spray. The air is forced into the tank by a foot-pump, which is fitted with rollers that run on tracks fastened to a wooden base. The small bracket *e* against which the heel pushes, may be adjusted in its distance from the heel plate. As the air in the cylinder *f* is compressed, it passes through the hollow piston rod *g* to the hose leading to the tank *b*, and the gauge shows the air pressure.

Another style of foot-pump, shown in Fig. 11, is claimed to be easier to operate and maintain a uniform air pressure in the tank than any other type, and is noiseless in its action. In Fig. 12 are shown two styles of hand pumps that may be used for the same purpose; one has a single- and the other a double-cylinder compressor.

29. Compressed air, ready for use, may be purchased in cylinders as shown in Fig. 13. The outfit comprises the tank *a*, regulator *b*, and gauge *c*. The air in these cylinders is compressed from 1,000 to 1,800 pounds per square inch, so that in order to use this compressed air, a regulating valve must be attached to reduce the pressure to 30 or 40 pounds, the usual working pressure of an air brush. After attaching the regulator *b*, the air valve may be opened by turning the handle *d*, which allows the air to pass to the regulator and out through the hose *e* to the hand piece. To regulate and maintain a uniform pressure, the handle *f* is turned until the gauge records the number of pounds pressure desired.

The cylinder is best situated at the right of the operator, so that the hose will not drag over the work when using the hand piece. The tank must not be allowed to freeze or be placed too close to a stove or radiator, as the contents will expand, causing the tank to burst. All tanks are equipped with a safety plug *g*.


(*a*) FIG. 14 (*b*)

The special clamps shown in Fig. 14 (*a*) and (*b*) may be purchased and can be attached to a wall or table, so that the tank will retain an upright position. If the tank falls, it is likely to burst.

The cylinders are merely loaned and the regulating valve and gauge must usually be purchased. There is a type of cylinder that has a regulating valve attached, but no gauge. The expense of this compressed air is about $2 a month, when the air is used about 6 hours a day at a pressure of about 30 pounds.

30. Electric-Power Compressor Equipment.—A good-sized art department will be equipped with an air compressor, driven by a motor of sufficient capacity to produce air at the required pressure and piped to each artist's desk, so that he can attach his air brush when necessary.

31. Where only two air brushes are in operation, an equipment shown in Fig. 15 is very serviceable, requiring little or no attention, as it starts and stops automatically when the pressure is too low or reaches the maximum amount. A motor *a* drives a flywheel *b*, which in turn operates the connecting-rod *c*. At the end of this connecting-rod is attached a piston, which moves up and down in the cylinder *d*, creates a suction, and forces air through the pipe *e* to the tank *f*. At the top of the tank is a gauge that registers the number of pounds pressure in the tank. To make this pump automatic in action, a regulator *g* is attached to the pipe *e*, which affects the electric connection as follows: The thumb nut *h* is turned so as to put a certain tension on the spring attached to the rod *i*, depending on the number of pounds pressure the gauge is to register. When the air in the tank has reached the maximum pressure required, the diaphragm inside the regulator *g*, moves upwards, moving the rod *i* and causing spring *i′* to break the electric contact at block *j*, and stop the motor. When the air in the tank has been

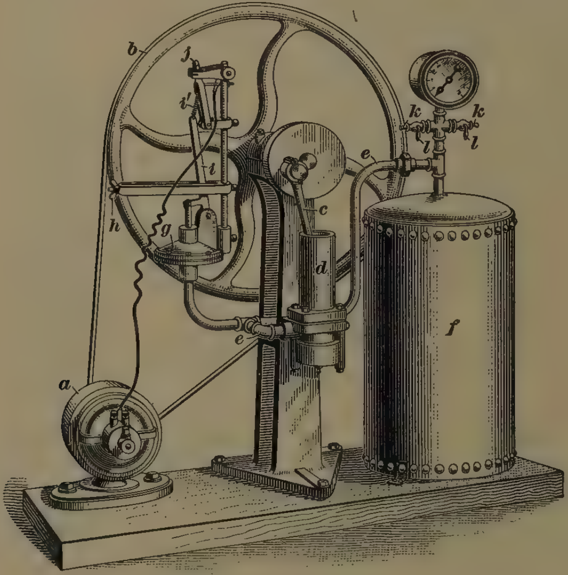


Fig. 15

gradually reduced, the diaphragm in the regulator *g* moves downwards, pulling the rod *i* and the spring *i'*, until the block *j* closes the connection and the motor starts. The hose connections for the air brushes are at *k*, and at *l* the two cocks may be shut off when the air brushes are not in use. The motor may be connected to an ordinary incandescent light socket. In Fig. 16 is shown the equipment just described and the manner in which the air brush is used.

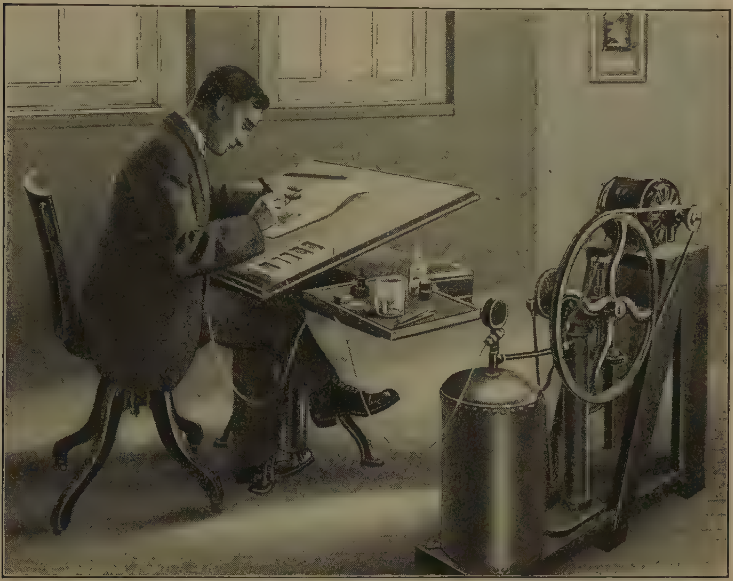


FIG. 16

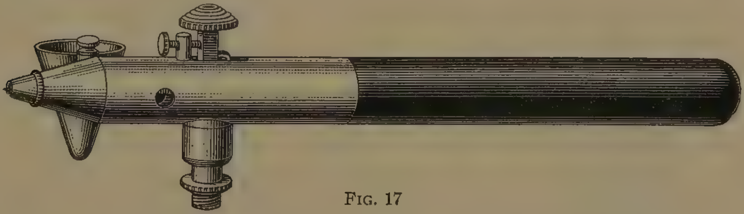


FIG. 17

32. Construction of Thayer & Chandler Air Brush. An outside view of a type of air brush used very extensively is shown in Fig. 17. It is $5\frac{1}{2}$ inches long. The style illustrated

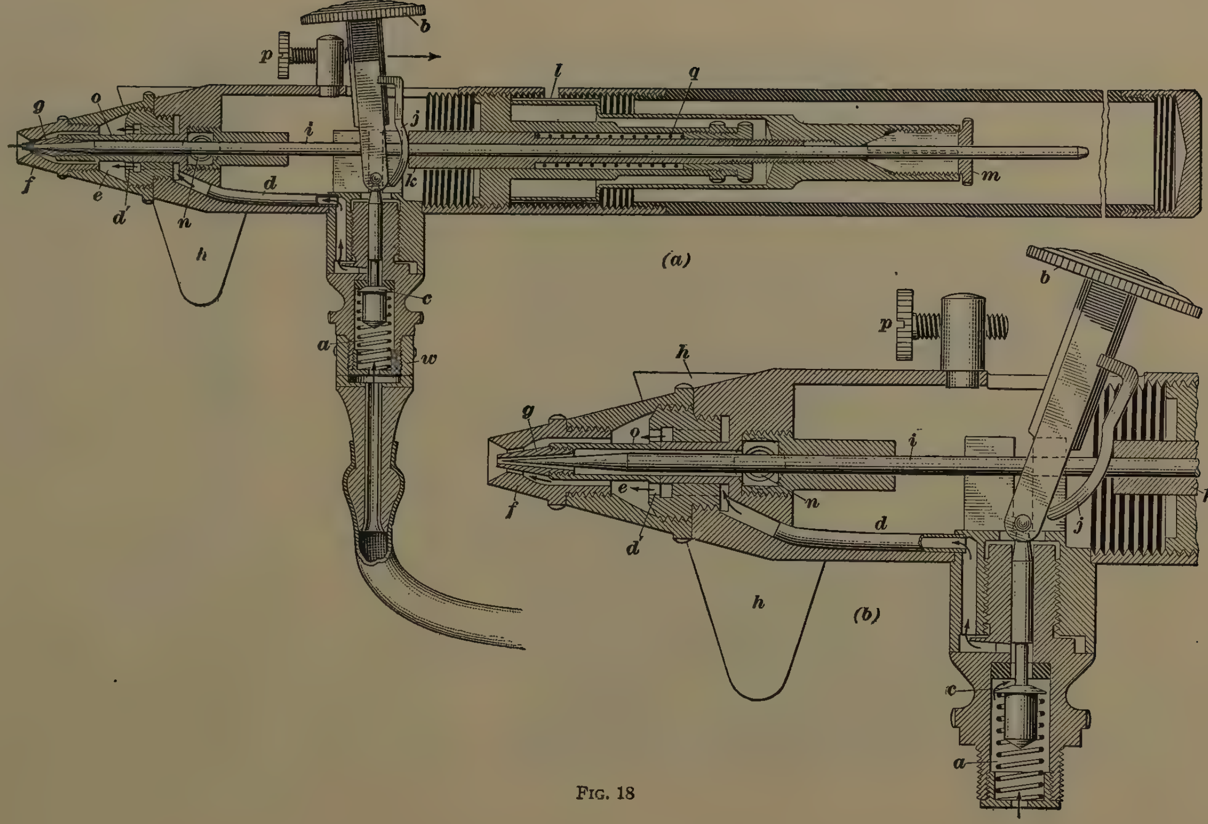


FIG. 18

is known as Model A and is manufactured by Thayer & Chandler, of Chicago. This brush produces a very fine spray, and is suitable for retouching photographs and making wash drawings for the halftone process. Models of this type of air brush are made for coarser work, such as show-cards, tinting china, pottery, etc.

In Fig. 18 (*a*) is shown a sectional view of this air brush; and in (*b*), an enlarged view, showing the working position of the mechanism of the end. The air from the tank passes to the chamber *a* out of the nozzle *f*, and carries with it the color in the form of a fine spray. The density of the spray depends on the amount of air passing through the instrument and on the position of the adjustable needle. As the air from the tank fills chamber *a*, a downward pressure of the finger on the lever *b* opens the valve *c* and admits the air, which passes through the tube *d* and three passages *d′* to chamber *e*, from which it passes out between the air nozzle *f* and the ink tip *g*. The color, which should be thin and free from all lumps, is contained in the cup *h*. When the operating lever *b* is pressed down and drawn back in the direction shown by the arrow, a horizontal movement is imparted to needle *i*, through the feeler *j*, to the needle sleeve *k*, adjusting thimble *l*, and needle chuck *m*. The air and color then pass through the instrument. The color leaves the cup *h* and goes through the duct *n* and on through a space between the needle *i* and tube *o* and ink tip *g*, where the color is enveloped by the swift current of air from the nozzle *f* and carried in a spray to the work. The color after leaving the cup *h* flows to the needle tip partly by gravity and partly by the suction of the air, which flows at high velocity past the needle tip, creating a partial vacuum inside the tube *o*. The fineness of the spray depends on the amount of air passing over the needle tip, which is regulated by adjusting the nozzle *f* of the brush; also by moving the lever arm *b*, which draws the needle backwards or forwards. In Fig. 18 (*b*) this is clearly shown.

33. Adjustment of the Air Brush.—To adjust the air brush, screw down the nozzle *f*, Fig. 18, and unscrew the split needle chuck *m*, which loosens the needle *i*. Push the needle gently forwards against the tip *g* and tighten the needle chuck. Turn the adjusting screw *p* about one turn to the right, to prevent the needle-point tip from being injured when the lever arm *b* is in its extreme forward position. The air brush is now ready for use; a downward pressure on the lever arm *b* allows air to pass through the instrument and the amount of space between the needle *i* and tip *g* allows sufficient spray to pass, so as to form a fine line, which may be increased in thickness by turning the adjusting screw *p* more to the right.

Several styles of color cups can be purchased; one has a siphon connection, which is designed to prevent the color from running to the color passages when the brush is not in operation. The cup shown in Fig. 18 is well designed, as it extends below the passage through which the color flows and prevents sediment from being carried through the instrument. Another cup contains a gauge filter, which prevents lumps of color from entering the brush. Most difficulties are obviated if thin color is used and plenty of water blown through the air brush.

34. Manipulation of Air Brush.—The operation of the air brush is very simple and soon learned by the novice. To give best results, a pressure of at least 25 pounds must be uniformly maintained. If the pressure falls below 25 pounds the spray becomes coarse and spots are thrown on the work. Air-brush manufacturers advise a pressure of from 30 to 40 pounds in order to give the finest spray.

Having filled the cup *h*, Fig. 18, with color, the air brush is held in the right hand the same as a pen, and downward pressure is put on the lever arm *b*, to admit air, which blows the color from the needle point in the form of fine spray, which is gradually increased as the lever arm is drawn back.

By moving the air brush to the right or left, and beginning at the top of the drawing and working gradually toward the lower part, a uniform tint may be formed. When small tints are desired, the backward pressure on the lever arm *b*, which regulates the supply of color, should be less and the air brush held closer to the work. When shading very small details, the air and color can be delicately controlled by the adjusting screw *p*, so as to produce a line. The quality of the spray may be regulated by the nozzle *f*; if it is screwed up too close, the air supply is shut off, and as the air supply decreases, the spray becomes coarse and spotty. To produce a fine spray when the lever arm is drawn back, the nozzle *f* should be unscrewed, and by making a few trials, the proper adjustment will be found. When the proper working distance at which the air brush should be held, as well as the amount of pressure put on the lever arm *b*, has been acquired, the practical operation of the air brush has been mastered. A great variety of effects may now be attempted. Before applying the air brush to a drawing, it should always be tried on a piece of paper to see that it is working properly.

35. Care of Air Brush.—The mechanism of the air brush is such that its working efficiency may be greatly impaired by its careless use, more especially through neglect in properly cleaning it after using.

To clean the brush a small quantity of clear water should be run through the cup several times in succession. The air pressure will afterwards quickly dry all of the parts where ink or water has come in contact with the ducts and needle, so that the brush is always ready for use, and no corrosion or clogging of parts can occur. When the work is finished and the instrument cleaned with water, the connecting nipple *w*, Fig. 18, which is attached to the hose, is unscrewed. Some models have a small projecting part at the forward end to protect the needle. If pliers must be used to unscrew certain parts, care should be taken to avoid damage of those parts. A reamer is furnished and is sometimes used for cleaning the tip of the brush. Before doing so, the ebony handle and the needle chuck *m* are unscrewed. The needle may now be removed and the reamer inserted very carefully. No pressure should be put on it and it is turned from right to left only. A drop of oil should be put on the reamer before inserting and it should only be used as a last resort.

Sometimes the spring *q* becomes weak from constant use and the needle is not forced forwards strong enough to maintain a fine spray. By slightly stretching the spring, this difficulty may be remedied.

36. If a new needle is to be inserted, unscrew the vulcanite handle, which gives access to the thimble *l*. Then unscrew the needle chuck by turning to the left and remove the needle. Before inserting the new needle, screw the thimble to the right sufficiently to push the lever arm *b* in its extreme forward position. Insert the new needle and gently push it against the tip *g*. Now screw the needle chuck *m* to the right until it clamps the needle firmly. To prevent the tip *g* from being injured by the needle striking it when the lever arm *b* is in its extreme forward position, turn the adjusting screw *p* several turns to the right, which relieves the needle pressure from the tip and at the same time prepares the brush for use. A fine line may be made with the present adjustment of the brush, and a broader line by turning the screw *p* more to the right. Pressure so delicate as to form a fine line is tiresome when maintained for any length of time; hence, the adjusting screw in the latest model makes the work much easier for the operator.

The needle should not be disturbed after it has been set. The tip *f*, Fig. 18, will then keep in good condition. If water is always run through the air brush before using, the air brush will not be clogged with color. Sometimes the air pressure is correct, but the color will not blow properly, because the color has dried and become caked in the passages leading from the cup *h*. If this is not the cause, the trouble may be that the needle is pressed too closely against the tip *g*. The slightest injury to any of the parts *f*, *g*, and *i* renders the brush unfit for use.

37. When the air brush fails to work properly, it should not be taken apart until the following tests show that the trouble cannot be otherwise remedied. To see if the air pressure is sufficient, water may be placed in the cup *h*, Fig. 18, and blown through the instrument. The spray regulator should be examined and also the proper adjustment of the needle for the required thickness of line. Care should be taken to avoid bending the needle point. The edge of the spray regulator *f* must not be injured; otherwise, color accumulates when passing from the needle. Dried color sometimes collects around the conical end of the spray regulator and causes the air brush to throw specks. The tip *g* is a very delicate part that must fit nicely around the needle and when removing the spray regulator *f*, care must be taken that the tip is not injured.

Dust, as a rule, causes trouble, so the slab on which the colors are mixed should be kept clean. The water that is used for this purpose and to blow through the air brush should be kept in a stoppered bottle. Rubber bottles made for this purpose may be purchased. A good grade of pigments should be used, ground fine, to avoid obstruction of the color passages. The air brush should be sent occasionally to the maker for examination and adjustment.

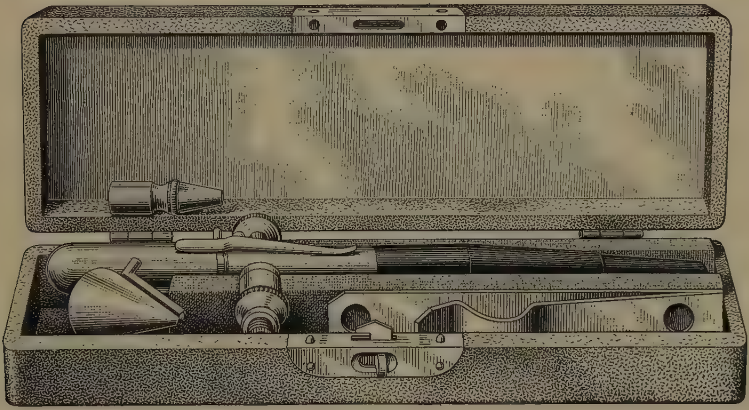
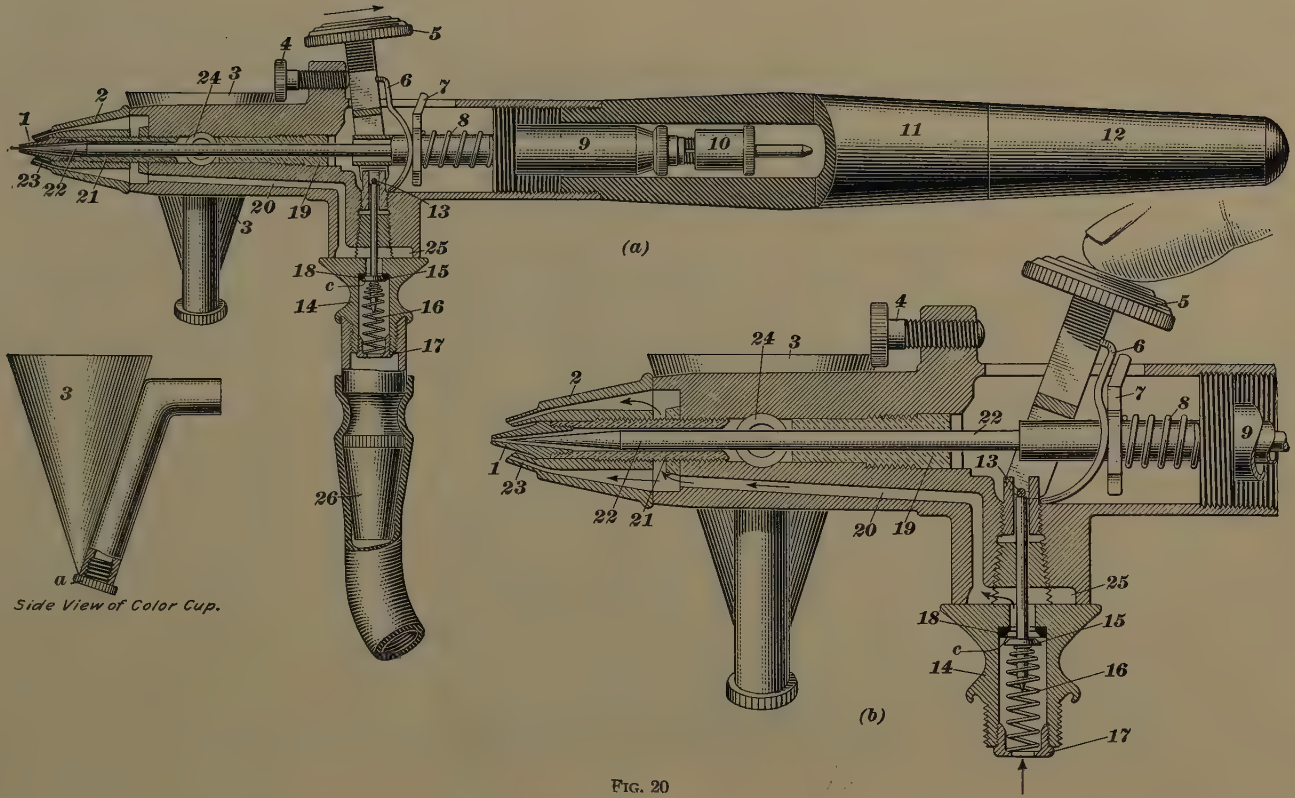


FIG. 19

38. When the work with the air brush is completed, the needle must always be drawn back by turning the adjusting screw *p* to the right. If the air brush is being used without the vulcanite handle the thimble *l* should be turned to the left to get the same result. This action prevents damage of the point and the likelihood of the needle sticking to the tip and breaking off the point. Sometimes color dries around the needle and the point, if broken and lodged in the tip, is difficult to remove, and in all probability a new tip will be necessary.



Side View of Color Cup.

FIG. 20

If the needle point is bent, or the tip *g* expanded, the spray is rendered imperfect in quality.

39. Construction and Operation of Wold Air Brush. The Wold air brush operates on the same principle as the one just described but is simpler in construction, and has several features that are a decided advantage to the operator. In Fig. 19 is shown an outside view of the air brush, which is furnished with a reamer and a piece of fine steel wire for cleaning the two holes in the air cap *2*. A clamp is also included, which may be screwed to the table or drawing board, and serves as a holder for the air brush when not in operation.

40. Two sectional views of the air brush are shown in Fig. 20, one (*a*) with the parts in normal position and the other (*b*) when the parts are in action. The tapered air-tube connection *26* is slipped into the rubber hose that leads to the compressed-air tank; the air brush is then screwed on this connection. The air passes from the hose through the air-tube connection *26*, and through the spring-retaining screw cap *17* into a cavity occupied by the spring *16*, which holds the valve *15* against a valve washer *18*, which acts as a seat and prevents the air from passing until a downward pressure is put on the lever arm *5*, when the valve *15* is opened, as shown in (*b*). The air then passes through the air chamber *25* and air duct *20*, and into the air cap *2*, which contains two projecting air tubes *23*, through which the air discharges. A partial vacuum is created by the passage of the air through these two small air tubes, so that when the lever *5* is pulled back in the direction of the arrow, color is drawn from the cup *3*, through the inlet *24*, into the space between the needle *22* and the color-tip head *21*, and through a small space between the color tip *1* and the needle. Air from the two air tubes *23* blows the color flowing from the needle point and produces a fine spray, which increases in volume as the lever *5* is being drawn back. The lever *5* when pressed down allows air to pass through the air brush, and when released is forced back to its normal position by spring *16*. Lever *5*, when drawn back in the direction of the arrow, is controlled or returned to its original position by the pressure of the auxiliary lever *6*, and the needle-tube guide *7*, which is acted upon by the needle spring *8*.

The front part of the needle-tube guide *7* presses against the auxiliary lever *6*, but also contains a cylinder through which the needle passes. This cylinder goes through another sleeve *9*, called the *needle bearings*, and at the end is threaded and split, so that the needle-chucking cap *10*, when screwed up, acts as a clamp on the needle; hence, the needle chucking cap *10* and needle *22* act as one piece when the lever arm *5* is drawn back. Screwing the needle bearing *9* forwards increases the pressure on the spring *8*, which in turn forces the needle-tube guide *7* against the auxiliary lever *6* and lever arm *5*.

41. Adjustment and Care of Wold Air Brush.—To regulate the spray so that lines of varying thicknesses can be made easily and maintained without effort, a line-adjusting screw *4*, Fig. 20, is used. When held in the right hand, this adjusting screw may be easily turned so that the lever arm *5* may be pushed slightly back, the amount depending on the width of line required.

In the Thayer & Chandler air brush, an adjusting nozzle is used to regulate the spray; but in the Wold air brush the air cap contains two small projecting air tubes *23*, placed at a certain angle, which confine the air so that much less air pressure is needed to operate the air brush. Even a 10-pound pressure is effective on small work requiring delicate handling. This arrangement is a decided advantage to the operator who uses a foot-pump to compress the air. It is also economical when a compressed-air tank is employed. When using a very low air pressure, the space between the needle and the tip *a* should be enlarged by the adjusting screw, when heavier coloring matter may be used.

42. The air cap *2* is easily unscrewed and a small steel wire that fits the air tubes *23* is furnished with the air brush; this may be passed through either hole in case of obstruction. The passing should be done from the inside of the air cap, to avoid injuring the shape of the small openings. The tip *1* by unscrewing may also be renewed if damaged. When renewing a needle the ebonite handle is unscrewed and the needle-chuck cap *10* loosened, when the needle may be withdrawn. Before inserting the new needle, the adjusting screw *4* is loosened so that the lever arm *5* is in the extreme forward position against the post through which the adjusting screw passes. The needle is then inserted and pushed gently forwards until it is in perfect contact with the tip *1*. The lever arm *5* should not be allowed to snap forwards or the needle may be injured, especially if it is in contact with the tip *1*. As a protection the adjusting screw is turned a few turns, which moves the lever arm slightly backwards in the direction of the arrow, and thus relieves the pressure of the needle on the tip *1*. The color receptacle may be easily cleaned by unscrewing the small cap *a* at the bottom of the cup.

43. This style of air brush, Fig. 20, does not spatter, as is the case when an adjustable nozzle is used, and for small work especially the spray may be easily confined to the area that is being shaded, so that fewer friskets are cut, with a consequent saving in time. After using, clear water should always be blown through the air brush to prevent clogging up of the passages, and the air then allowed to blow through, which will dry the color passages. The air brush is unscrewed from the air-tube connection *26*, leaving this part always attached to the hose.

The needle is made of a non-corrosive metal ground to a perfect taper, so that it fits the tip *1*. If the point of the needle becomes bent, the air cap may be unscrewed and the needle straightened by stroking with the fingers. If unsuccessful, the needle may be removed from the brush, as previously described, when the point can easily be straightened.

The especial advantages of this brush are that a fine line can be easily made and controlled and that the color leaving the needle is entirely free from obstruction. This style of air brush, therefore, is less likely to produce a coarse spatter the moment the lever arm *5* is pressed down and drawn back. The metal cap *12* can be taken off and slipped on the other end of the air brush to protect the needle and tip from injury when the air brush is not in use.

To do good work with an air brush, the student must learn to press the lever arm *5* downwards the desired amount, and be able to draw it back sufficiently for the tint required, and must hold the air brush at the same time at the proper distance from the paper. The important point is that pressing down on the lever arm *5* opens the air valve and that pulling the lever backwards in the direction of the arrow draws the needle back and allows the color to leave the cup and be blown off the point in the form of spray.

PHOTO RETOUCHING WITH THE AIR BRUSH

44. Preparation of Photographs.—As the surface of a photograph is of a greasy nature and does not absorb water readily, it should be prepared to receive the color, before retouching. A small quantity of wet absorbent cotton, when rubbed over sheet gelatin, dissolves some of the gelatin. The cotton can then be rubbed over the surface of the photograph, thus preparing it for the retouching process. A good plan is to break up the gelatin and put it in a bottle and add water to it; this solution is always ready for use. A few drops of acetic acid added to the solution improves it.

A too liberal use of the air brush will result in a hard mechanical picture devoid of atmosphere. Details such as wood graining, brickwork, floor lines, tiles, and earth should not be worked in a hard mechanical way when painting by hand, but should be only suggested, and this change of texture will break the monotony of too much air-brush work.

Brushes, pigments, rulers, **T** squares, and ovals are usually furnished in an art department; but the air brush is the property of the artist. Every artist handles the air brush in his own way, and may adjust it so that another cannot do satisfactory work with it. Each artist also furnishes his own color slab for mixing colors.

45. Friskets and Their Use.—Frisket paper is a transparent paper specially manufactured for use in covering such parts as are not to be sprayed with color while adjoining parts are being shaded. Before using it on a photograph or drawing, frisket paper should receive about three coatings of dilute rubber cement on the glossy side. Each coat should become fairly dry, so that it will not come off when the succeeding coating is applied. These sheets are more serviceable if prepared a few hours before using, so that the surface will be just tacky enough to adhere closely. If the rubber cement has not dried sufficiently on the frisket paper before its application to the photograph or drawing, its removal will be difficult and it is liable to cause a stain. This occurrence is more likely if the frisket paper is used to cover parts that have already been retouched.

Frisket paper is of such a texture that it may be cut with a sharp knife and leave no fibers along the edges, as would be the case with ordinary tracing paper. The paper cuts easily, is waterproof, and will not curl up along the edges when moistened with the spray, which would allow color to get underneath and destroy the sharpness of the outline. Pressure on the knife, when cutting the frisket, should be avoided, or the surface of the photograph will be injured.

46. Color Pigments Used in Retouching.—As photographers experience great difficulty in copying photographs retouched with all sorts of intricate color combinations of different artists, tubes of special photo-retouching colors are now extensively used and meet with favor by retouchers generally. The colors used depend in a measure on the kind of photograph that is to be retouched. Solio prints, which may be of a reddish brown or purplish tone, may be retouched with light red, Indian red, ivory black, and Vandyke brown, and to get the very darkest values Talen's retouching red may be used.

For retouching black-and-white prints, such as velox, the colors used are ivory black, yellow ocher, and sap green; if the print is glossy and a solid black tint is required, Talen's retouching brown or glossy black is used. Velox and solio prints give equally satisfactory results when reproduced.

All of the colors mentioned are mixed with white to produce a desired value, as the main idea is to match the color of the photograph and then there will be less difficulty in the final result. A mixture of black and white produces a tint that is bluish in tone and usually loses its strength when photographed. To overcome this defect, other colors like those previously mentioned are added. Talen's process black is useful for very dark places and for defining lines. It is very glossy and photographs well. This black should not be mixed with any other color, as it dries streaked when used for a tint. It graduates very bluish in tone also, so it should always be used pure.

47. A great many white water colors on the market are recommended as being the correct thing for the retoucher. The main requirement of a good white is good covering power; otherwise, there is a waste of the artist's time. The white should be free from grit, should flow freely through the air brush, and should photograph very white. The white pigment most widely used is a French white in tube form. Other white water colors that find favor with some artists are known as Bonny's white, Semple's white, and Winsor & Newton's flake white.

For large, coarse subjects requiring a large amount of color, a white pigment called Albanine is sometimes used; this dries very white. A little gum is added to prevent it from rubbing off, as it is similar to fresco white. The chief difficulty in working with Albanine is that, when mixed with another color and put on a photo, the shade of color it will assume when dry is hard to judge, as, like all fresco colors, it always dries lighter than when applied.

48. Points to Be Considered When Retouching Photographs.—Most photographs require retouching before they are suitable for reproduction by the halftone process, as it is necessary to exaggerate the contrast and thus overcome the flat effect caused by the halftone screen. Without retouching, the reproduction would be gray, though this defect may be partly remedied by reetching or burnishing. The subject itself must show quite sharp contrasts so that there may be made therefrom a satisfactory halftone without retouching.

In retouching, the general color scheme or the masses of light and shade governing the entire subject, must be considered, as on it depends the plan to be adopted; otherwise, an endless amount of meaningless tints will be used and the result will be unsatisfactory and expensive. Some photographs are dark in tone so a touch of strong white would spoil the key of the entire photograph, make it appear grayer, and necessitate its entire going over. In such subjects, the retouching should be done with a dark color, which allows the main body of the photograph to become a middle tone, and by the use of lighter tints carefully placed, the work as a whole will have a finished appearance. Additional contrast may then be obtained by reetching. A good retoucher will study to retain as much of the original photograph as possible. The most successful distribute their work over a photograph in such a manner as to touch on all the essentials without going into too many small details. In some cases, such as rough castings and objects that have photographed very black, the entire picture must be gone over because of the surface texture. Again, some manufacturers, when having illustrations made for their catalogs, or advertisements, insist that the entire surface of the photograph be painted over.

49. After the student has mastered the control of the air and color of the air brush, he may practice making a light flat tint about 5 inches square and may then make several similar tints, each of a darker value, and thus become accustomed to working over a moist surface. The air brush must be kept at a proper distance from the paper when spraying to avoid getting the color in puddles. Light and dark graduating tints may then be attempted. The process of grading a tint suddenly from light to dark, and confining the spray so that the color desired is kept within a certain area, should then be practiced. A cylinder of large diameter, which is to be shaded with graduating tints, may now be attempted. After this is mastered the student should shade a pipe about $\frac{1}{2}$ inch in diameter. To get these long, evenly graduated tints, it is well to use a straight piece of cardboard for guiding the spray, as described below.

If the proper control of the air brush has been mastered, the student should have little difficulty in applying his previous instructions in light and shade.

50. Blended Tints.—When making with an air brush tints that are to graduate suddenly, as cylinders of small diameter, it is very difficult to keep the spray in a straight line and produce a perfect blended tint. A simple method is to use a straightedge, or thick piece of cardboard, so that the air brush, when held at an angle to the surface of the drawing, will allow the color to strike the edge and distribute the color

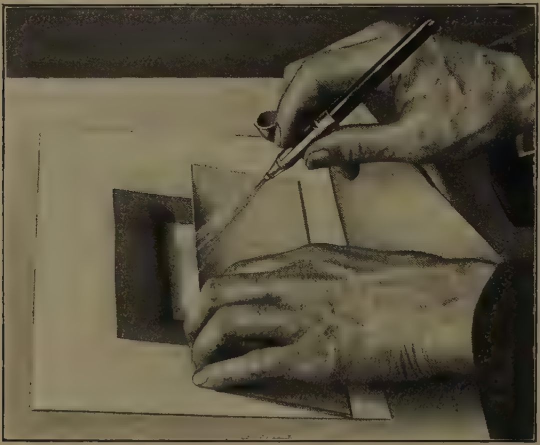


Fig. 21

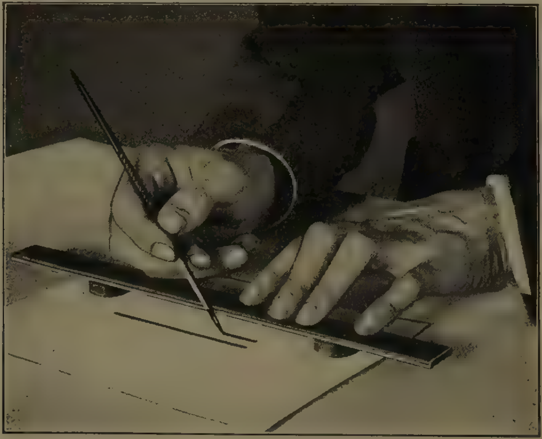


Fig. 22

and produce a straight blended edge. A straightedge held at an angle to the surface of the paper, as shown in Fig. 21, may also be used when a larger blend is desired.

51. Striping and Flat Tints Made by Hand.—Considerable striping by hand is necessary in retouching many photographs. Some artists use a straightedge held at an angle to the paper, or a small board with small cleats that raise the straightedge sufficiently from the surface of the paper to guide the metal part of the brush. An illustration of this device and of the way the brush is held when striping is shown in Fig. 22.

To paint a smooth tint with opaque color by hand on a photograph requires considerable practice. The surface must first be carefully prepared with gelatin, so that the photograph will take the color readily. The color should be thin, well mixed, and applied with a flat brush, using short definite strokes, as shown at *a*, Fig. 23. A second series of strokes are made to overlap and break the joints as at *b*, and this process is continued until the entire surface is covered. After the first series of brush strokes are dry, a second coating may be applied in like manner and as far as possible so that previous overlappings may be broken up and a more even tint thus produced, as shown at *c*. The third or fourth coating, when necessary, is put on, using very little color in the brush; in fact, at times the brush may be in a semidry state and the strokes made diagonally across the two previous coatings, which if properly done will result in an even tint, as shown at *d*. The main difficulty experienced by beginners is caused by touching the color while wet. If a part appears a trifle streaked while wet, it may dry fairly even; if not, the tint may easily be gone over. Sufficient color should be mixed at one time for the entire tint, otherwise it is difficult to match it.

52. General Hints for Retouching Various Materials. The artist in an engraving plant is usually controlled by three things: the requirements of the customer, the cost, and the time allowed for production. The retoucher should therefore use all the short-cut methods available. Mechanical subjects usually require a great deal of retouching. Some firms paint

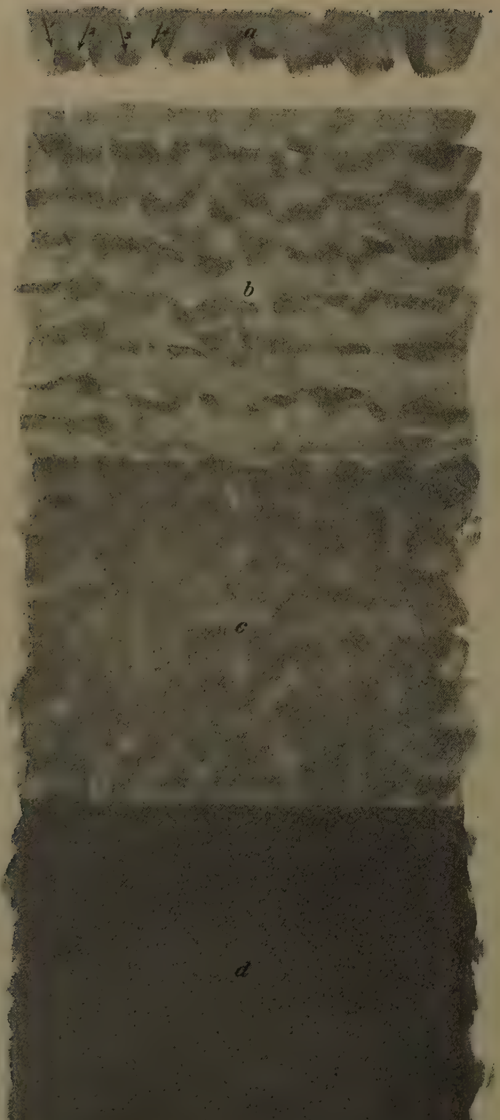


FIG. 23

their machines a gray color, so that more perfect photographs can be made, black shadows avoided, and details brought out more clearly. Castings are often made very dark in color by retouching; but the resulting reproduction is not pleasing to the eye. A medium-gray tone, similar to the color of the material itself, will prove more satisfactory.

While the camera records detail with great fidelity, it also records defects, and the retoucher should be able to produce a surface that conveys the character of the material from which it is made. Certain polished parts may receive reflections which should be corrected, as they tend to distort the surface.

53. The treatment of the background has much to do with effect, and here good judgment should be used. If an object is dark in color, a background of a delicate tone sufficiently strong to relieve the hard cut-out appearance is effective. If a subject is to be printed on a cheap grade of paper, the background should be light in color or eliminated entirely. Blended edges, called *vignetting*, must be carefully treated in both retouching and engraving to avoid hard edges in printing. If a subject is light colored, such as paper, china, cut glass, tin, and nickel, a darker background may be used to advantage. Many pictures are taken with unsuitable backgrounds, which must be modified, or softened around the edges. Telegraph wires and poles are often a defect in an outdoor photograph, and must not show in the reproduction, and the retouching should match the color of the photograph as closely as possible. Backgrounds and foregrounds require considerable study and a variety of treatment, due to the lighting, the nature of the subject, and the material. A subject should not be made too smooth and soft, when it would be possible by a few brush marks judiciously placed to give character.

The instruction in detailed methods of using the air brush to retouch various materials will be continued in the Section that follows, wherein training will be given in retouching photographs to be reproduced by the halftone process for definite classes of commercial illustrating work, catalog cuts, advertisement pictures, portrait work, etc.

RETOUCHING EXERCISES FOR HALFTONE ENGRAVING

GENERAL INFORMATION

54. Optional Arrangement of Work in Retouching. The exercises in drawing, painting, and retouching for halftones that are laid out in this and the following Section are optional; the student need not prepare and send them in unless he feels that his needs require such a training, and unless his circumstances will allow him to purchase an air-brush outfit and all necessary supplies. The exercises have been laid out, however, according to the same system as the exercises in the subjects where required work was prepared and sent in.

It is assumed that the student will not prepare and submit to the Schools these exercises in retouching; but should he decide to do so, he must first notify the Schools, so that proper arrangements may be made for his instruction. If he has access to, or can purchase, an air-brush outfit, and decides to do the regular exercises as laid out, the same requirements will be in force as apply in the case of subjects where there is required work.

55. Character of the Retouching Plates.—The exercises in retouching are arranged as plates, as in the case of previous subjects. A standard uniformity of size can be maintained on these plates, which should be about 10 in. ×15 in., or thereabouts. The exercises on the various plates may be arranged in such a way as to allow all plates to be worked upon in a vertical position; that is, 10 inches wide by 15 inches high.

The air brush, while simple to operate if instructions are followed, is not a toy; and considerable preliminary practice with it will be necessary in order to secure satisfactory results, before the regular work on the plates is attempted.

PLATE 1

56. Halftone Exercise for Plate 1.—Prepare a composition picture, about 7 inches wide by 10 inches high, and render it in pencil or crayon (with background wash) so as to be suitable for halftone reproduction. Fig. 7 and the accompanying text may be referred to for the general style of the rendering, but the picture and its rendering for this exercise is to be an original composition.

57. Final Work on Plate 1.—Letter or write on the back of the sheet the title, Plate 1: Retouching for Halftones, Part 1, and the class letters and number, name, address, and date, in the usual way, and lay the plate aside, to be sent to the Schools when Plate 2 is forwarded. Proceed then with Plate 2.

PLATE 2

58. Halftone Exercise for Plate 2.—Prepare a composition picture, about 7 inches wide by 10 inches high, and render it in wash, transparent or opaque or in a combination of the two methods, so as to be suitable for halftone reproduction. Figs. 8 and 9, and the accompanying text, may be referred to for the general style of the rendering, but the picture and its rendering for this exercise is to be an original composition.

59. Final Work on Plate 2.—Letter or write on the back of the sheet the title, Plate 2: Retouching for Halftones, Part 1, and the class letters and number, name, address, and date, in the usual way. Then send Plates 1 and 2 together to the Schools for examination, and proceed with Plate 3.

PLATE 3

60. Exercise A, Plate 3.—As practice in the preliminary manipulation of the air brush, lay out, in the upper left-hand $5'' \times 7\frac{1}{2}''$ rectangle of the plate, an outline rectangle about 4 in. × 6 in., and cover it with a very light flat tint of gray, sepia, or other color, blown on by means of the air brush. This can be done only after a familiarity with the air brush has been acquired and considerable preliminary practicing has been done.

61. Exercise B, Plate 3.—In the upper right-hand rectangle of the plate, lay out an outline rectangle 4 in.×6 in. and cover it with a very dark (but not black) flat tint of gray, sepia, or other color, blown on by means of the air brush.

62. Exercise C, Plate 3.—In the lower left-hand rectangle of the plate, lay out an outline rectangle 4 in.×6 in. and cover it with a graded tint, blown on by the air brush, starting with a very light value at the top of the rectangle and gradually increasing the depth of the tone value until, when the bottom of the rectangle is reached, the value will be practically black.

63. Exercise D, Plate 3.—In the lower right-hand rectangle of the plate, lay out an outline rectangle 4 in.×6 in. and cover it with a graded tint, blown on by the air brush, starting with a very dark value at the top of the rectangle and gradually lightening the tone value until, when the bottom of the rectangle is reached, the value will be practically very light gray or almost white.

64. Final Work on Plate 3.—Letter or write on the back of the sheet the title, Plate 3: Retouching for Halftones, Part 1, and the class letters and number, name, address, and date in the usual way. Then send the plates to the Schools for examination, and proceed with Plate 4.

PLATE 4

65. Exercise A, Plate 4.—In the upper half of the upper $10'' \times 7\frac{1}{2}''$ rectangle of the plate, practice doing horizontal "striping" with the air brush; that is, with the nozzle so adjusted that horizontal lines of varying widths, from very thin to very broad ones, may be made.

66. Exercise B, Plate 4.—In the lower half of the upper $10'' \times 7\frac{1}{2}''$ rectangle of the plate, practice rendering horizontal pipes of various widths, blending the stripings in the manner illustrated in Fig. 21.

67. **Exercise C, Plate 4.**—In the lower left-hand 5″×7½″ rectangle of the plate, draw a vertical cylinder, and render it by means of air-brush work, applying the principles of light and shade and the technical knowledge of air-brush rendering.

68. **Exercise D, Plate 4.**—In the lower right-hand 5″×7½″ rectangle of the plate, draw a sphere, and render it by means of air-brush work, applying the principles of light and shade and the technical knowledge of air-brush rendering.

69. **Final Work on Plate 4.**—Letter or write on the back of the sheet the title, Plate 4: Retouching for Halftones, Part 1, and the class letters and number, name, address, and date in the usual way. Then send Plate 4 to the Schools for examination, and if all work on previous plates has been completed, proceed with Plate 5.

PLATE 5

70. **Exercise A, Plate 5.**—In the upper 10″×7½″ rectangle of the plate, practice doing hand striping of horizontal lines with a red sable brush and pigment, as accessories to air-brush work, working in the manner shown in Fig. 22 and as described in accompanying text. Make the lines of varying widths, from very fine ones to very broad ones, and have them extend horizontally across the rectangle.

71. **Exercise B, Plate 5.**—In the lower 10″×7½″ rectangle of the plate, practice laying a flat tone of opaque water-color pigment, such as charcoal gray, sepia, Indian red, etc., using a flat brush. Follow the method illustrated in Fig. 23, and described in the accompanying text. The space occupied by the flat color value should be about 8 in. × 5 in., and the final result of the process should look like (*d*), Fig. 23. Considerable preliminary practice work will be necessary before this final rendering can be done.

72. Final Work on Plate 5.—Letter or write on the back of the sheet the title, Plate 5: Retouching for Halftones, Part 1, and the class letters and number, name, address, and date in the usual way. Then send Plate 5 to the Schools for examination, and, if all work on previous plates has been completed, proceed with Plate 6.

PLATE 6

73. Air-Brush Exercise for Plate 6.—As an exercise in air-brush rendering, set up some or all of the wooden geometric models, used when studying model drawing and light and shade, arranging them in a pleasing manner from the standpoints of composition, light and shade, etc. Make a careful pencil sketch of the models, full size, doing a certain amount of pencil rendering, arranging the whole composition in a panel about 7 inches wide by 10 inches high. Then make an air-brush rendering, using friskets at their proper places, blowing in the background and foreground in appropriate values, flat, graded, mottled, or vignetted, as seems best, and rendering the lights and shades on the models themselves to show modeling with carefully placed tints blown on with the air brush.

74. Final Work on Plate 6.—Letter or write on the back of the sheet the title, Plate 6: Retouching for Halftones, Part 1, and the class letters and number, name and address, and date in the usual way. Then send Plate 6 to the Schools for examination.

If any redrawn or rerendered work on any of the plates of this Section has been called for, and has not yet been completed, it should be satisfactorily finished at this time. After all the required work on the plates of this Section has been completed, the work of the next Section, in which the training in retouching for halftones is continued, should be taken up at once.

RETOUCHING FOR HALFTONES

(PART 2)

RETOUCHING FOR COMMERCIAL ILLUSTRATIONS

STAGES OF PROCEDURE

1. Introduction.—The chief use of the air brush in commercial art work is for the retouching of photographs of mercantile and other articles from which halftones are to be made to serve as illustrations for catalogs and booklets, and for advertisements of various kinds. The purpose of this Section is to show the methods used for retouching articles of various shapes, surface textures, etc. The method followed will be to present reproductions of a diversified collection of photographic air-brush retouching, and to give illustrations and descriptions of the method in which the retouching is done in each case. The examples given are not supposed to represent the finest specimens that could be obtained, but with a few exceptions they show about the average quality of work required for ordinary commercial work.

2. Applying and Cutting Frisket Paper.—To show the method of retouching a photograph of some silverware, it will be supposed that a vignetted halftone of the photograph shown in Fig. 1 is desired, the background to be light in color. The photograph is, first of all, rubbed with the gelatine solution so that it will take the color. When this is dry, the prepared frisket paper is applied; if the frisket paper is too moist when

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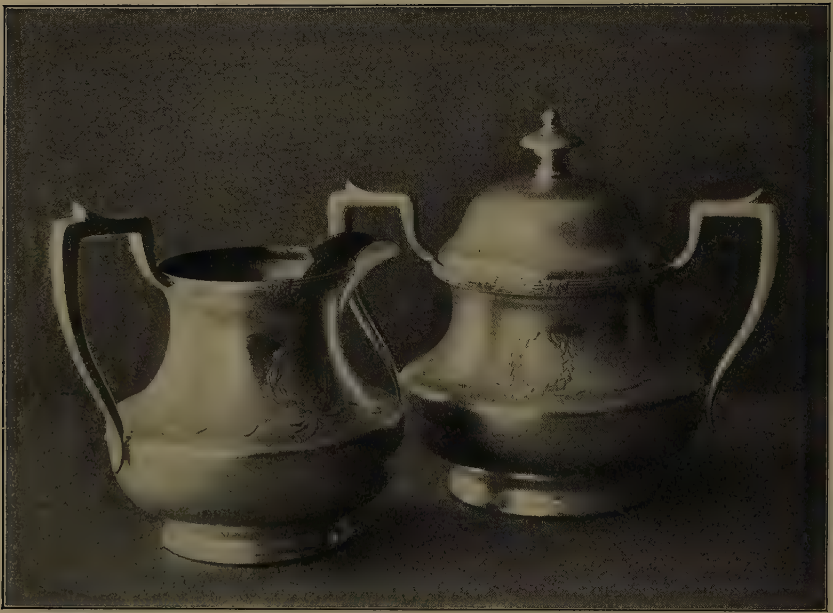


FIG. 1

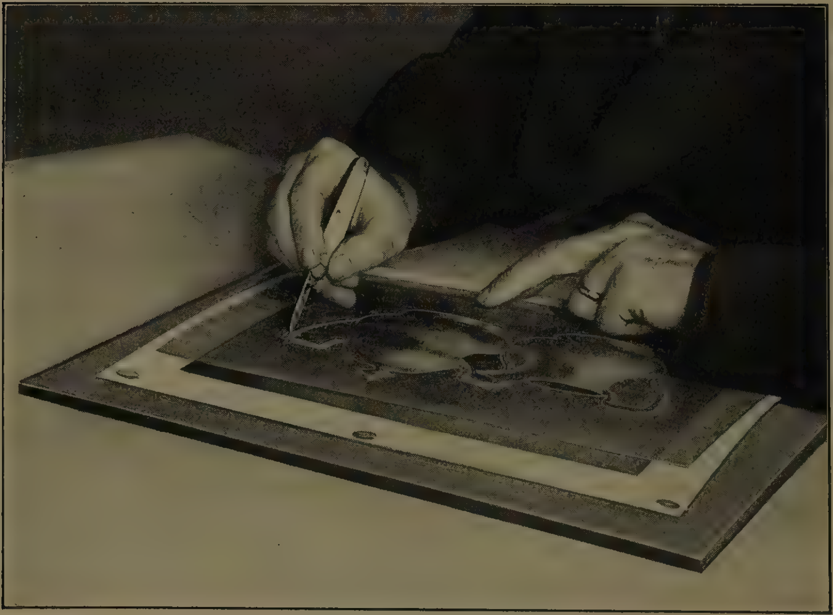


FIG. 2

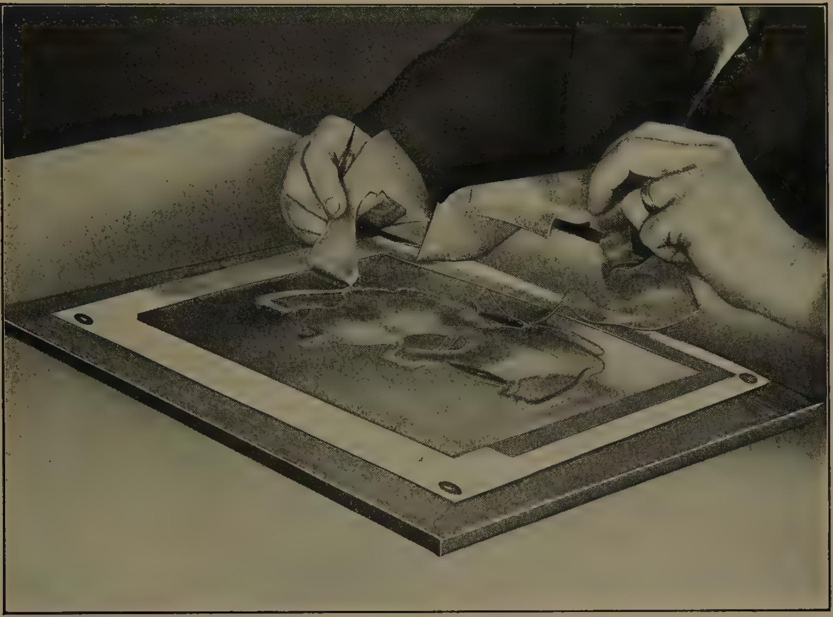


Fig. 3

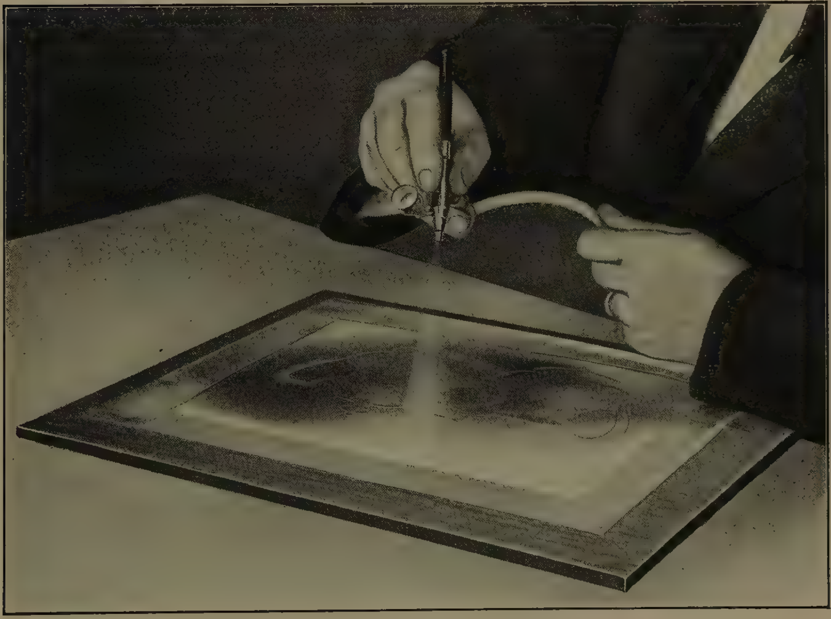


Fig. 4

applied to a painted surface, staining of the tints is likely to occur. The paper is then cut with a sharp-pointed knife, along the outlines of the pieces of silverware, as shown in Fig. 2, and the part that covers the background is lifted, as shown in Fig. 3. This leaves only the silverware protected from the spray of the air brush.

3. Retouching the Background.—As it is unprotected, the background receives the first spraying. When doing this, the hand piece of the air brush is held in the manner shown in Fig. 4, the left hand being used to support the small rubber hose that supplies the air. The work is begun by spraying a thin coating of white to reduce the general tone of the background, omitting, in the operation, those portions of the photograph that are about the desired value. A medium value is used for the cast shadow. When these background tints appear to be the proper depth, the effect is judged by lifting an edge of the frisket from the surface of the photograph, so as to compare the contrast with the color of the adjoining parts underneath. In Fig. 5 is shown the finished background as it appears with the frisket paper partly removed.

4. Retouching Surfaces of Silverware.—The surfaces of the silverware now require a certain amount of treatment, which consists of putting in reflections and subduing others, and strengthening the decorative work. To add air-brush work on the silverware itself necessitates masking the background and handles to protect them from the spray, as shown in Fig. 6. The frisket paper is allowed to dry, so as to be just sufficiently tacky to adhere to the surface of the photograph. In this condition, the frisket paper could be applied without danger of soiling the air-brush background.

The surfaces of the silverware at this stage are too dark on the shadow side, and lighter tints of opaque color are sprayed over these parts, so that a better representation of silver is obtained. Before applying it to the actual work the artist should see that the air brush is working properly and that the lever arm is under proper control by trying the spray on a separate piece of paper. After the tints have been properly

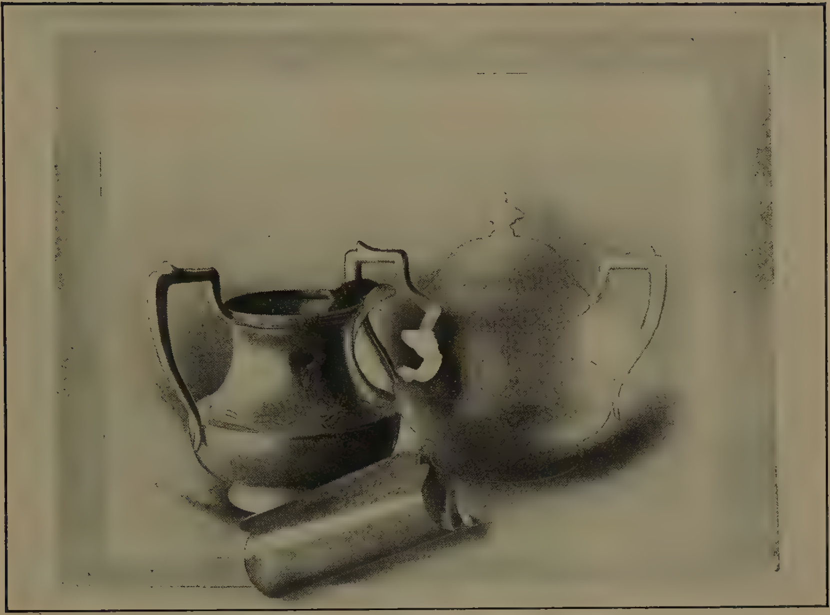


FIG. 5

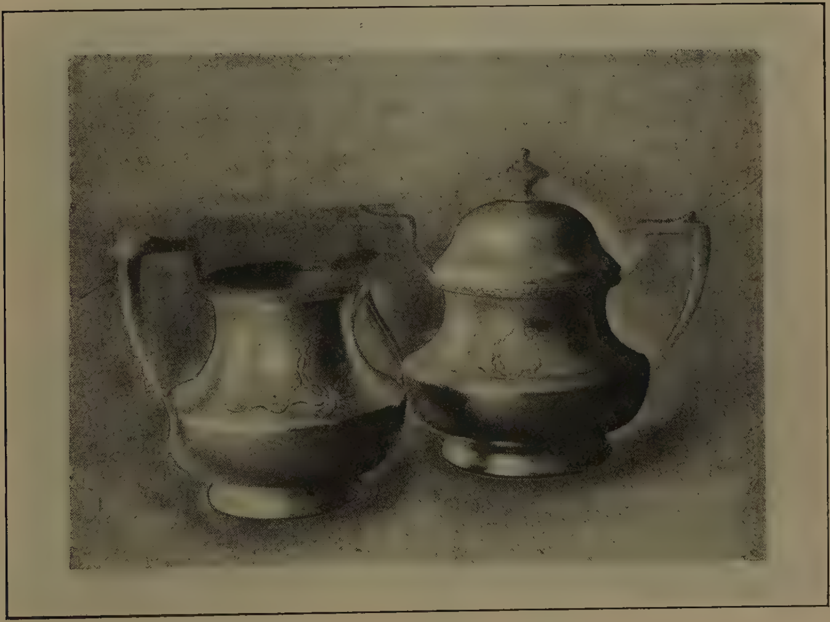


FIG. 6

graded, the frisket is removed. The handles and knob, being too small to treat with the air brush, are painted over by hand. The decorative work in the unretouched photograph is too indistinct to show properly in the reproduction and is, therefore, painted with good contrast, which adds to the general effect.

5. **Completely Retouched Photograph.**—After all necessary retouching has been done on the photograph, it appears

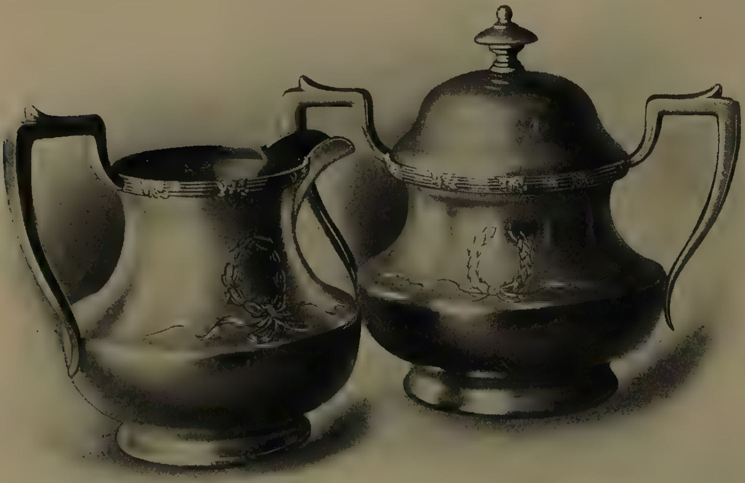


Fig. 7

as shown in the reproduction in Fig. 7, which photograph is then ready for the halftone reproduction. In examining the values shown in Fig. 7 due allowance must be made for the fact that this is a reproduction of the photograph and not the retouched photograph itself, and also that there has been considerable reduction. The retouched photograph itself appeared a trifle more brilliant, which brilliancy was lost to some extent by the halftone screen, which is always necessary when making a halftone reproduction. The screen used for this halftone is 150 lines to the inch.

TYPICAL EXAMPLES OF RETOUCHING

6. Camera.—In Fig. 8 is shown a photograph of a camera used in a sporting-goods catalog as it appears before retouching, and in Fig. 9 the same photograph after it has been retouched and made ready for the engraver. A vignetted illustration is required, so a frisket is cut masking the camera, and the background is sprayed with the air brush as shown. The reflections on the polished metal surfaces appear black and the detail and definition indistinct. The retoucher paints the surfaces that are either too dark or too light so as to get the necessary contrast, and, by striping, the details are emphasized. Most of the surfaces are painted by hand except that portion underneath the bellows, the dark side of the bellows itself and leather-covered box being deepened in tone with the air brush, diluted black being used so as not to obliterate the leather texture. The rubber bulb is slightly modeled with the air brush. Most of the metal fittings are painted in by hand with pure white and dark color to bring out the effect of polished nickel. For the darkest portion, process black is used.

7. Revolver.—In Fig. 10 is shown a photograph of a revolver before retouching. This subject is also to be vignetted and the background is put in first, so a better idea can be obtained of the amount of retouching necessary on the article itself. The main defect in this photograph is the reflections, which distort the shape of the cylinders, and the handle is too black and lacks detail. The large revolver cylinder is put in with the air brush, but the barrel is striped by hand, using the edge of a rule as a guide for the brush. The checkered work on the handle has to be carefully brightened by striping, and the ornamental work is also defined, as can be observed by comparing the two illustrations. Sharp snappy touches of process black in certain parts produced the necessary contrast. Putting in little accidental lights and reflections gives the work an artistic touch when the subject is of a mechanical nature. The appearance of the retouched photograph of the revolver is shown in Fig. 11.

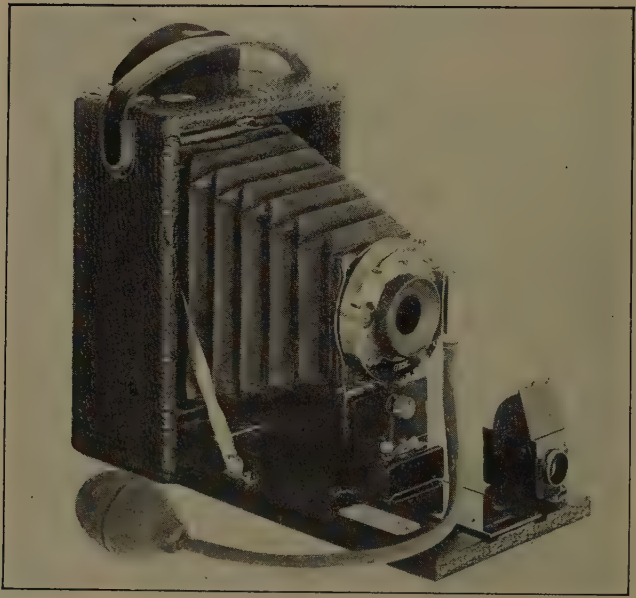


Fig. 8

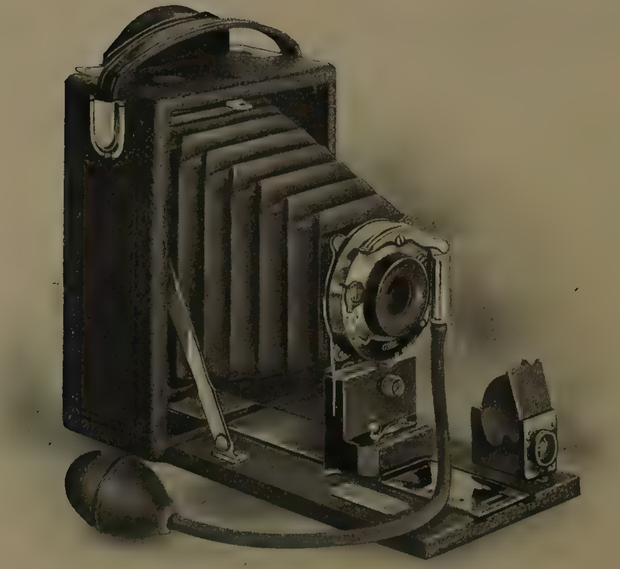


Fig. 9

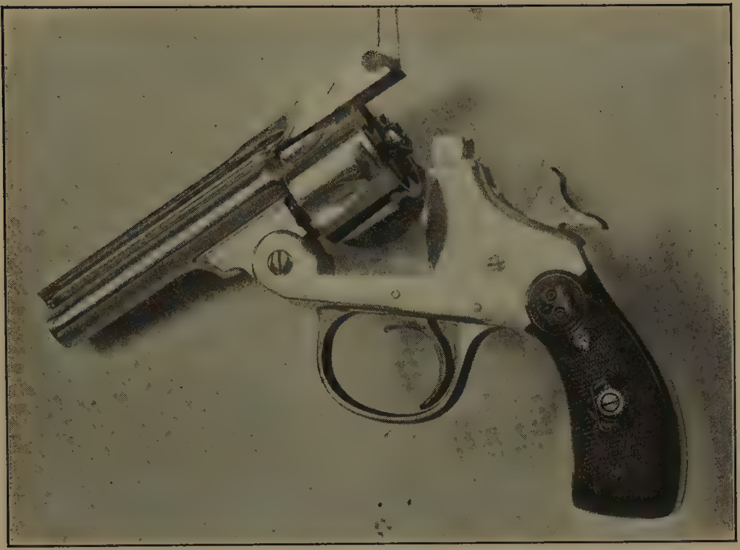


Fig. 10

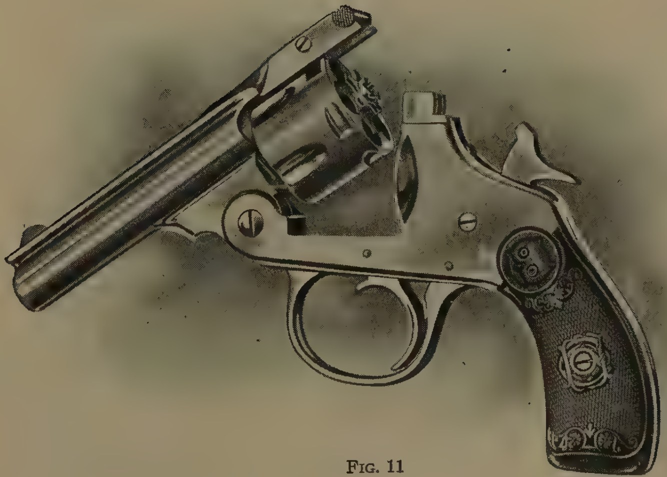


Fig. 11

8. Air-Brake Valve.—An air-brake valve is shown in Fig. 12 as reproduced in halftone from an unretouched photograph. As previously stated, it is the aim of the retoucher to save as much of the surface of the photograph as possible, but when the surface of the photograph has not sufficient contrast and has a texture like a rough casting, it is quite impossible to match it, either by hand work or with the air brush.

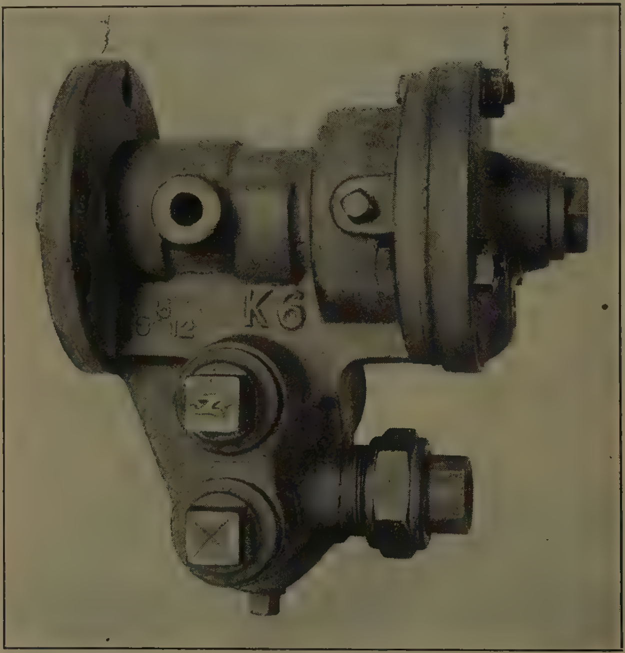


FIG. 12

It, therefore, becomes necessary to go over the entire surface to make a really satisfactory illustration.

It is advisable, when beginning to retouch a subject of this kind, to consider the background first, as on this the effect of the tints on the valve itself depends. If the background is white on the photograph, this need not be taken into consideration. Ordinarily it would be necessary to cut a frisket to treat the background, but in the case of a silhouette, or cut-out halftone, a broad stripe of white painted by hand around the outline will give the retoucher an idea of the value of the tints on the valve and serve as a guide for the engraver when cutting away the halftone screen on the plate.

9. The surface of the photograph having been prepared with gelatin to receive the color, a white stripe is painted around the object, and, when dry, prepared frisket paper is laid over the surface and certain parts cut out, exposing the casting. Both black and white colors are sprayed on the photograph to overcome the rough texture of the casting, and after the exposed parts of the photograph have been treated, the frisket paper is removed, when the illustration appears as shown in Fig. 13. A second piece of frisket paper is then laid on, exposing the other parts of the photograph; this frisket, too, after serving its purpose, is removed.

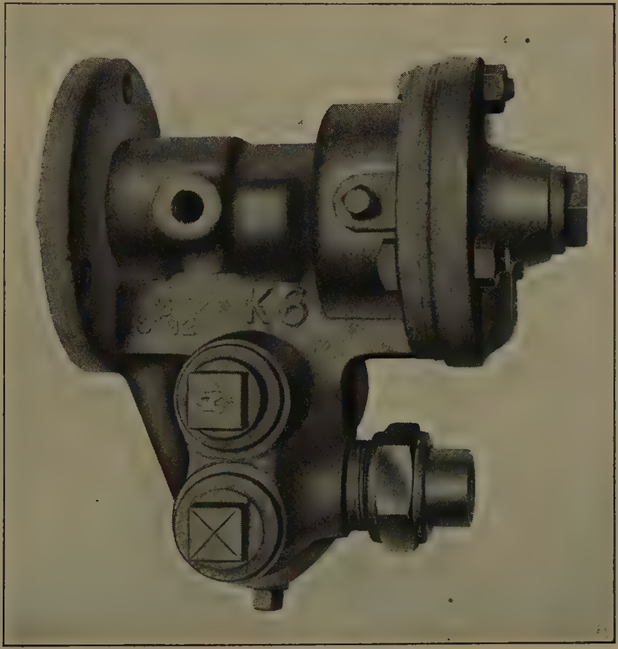


FIG. 13

After the main surfaces have been treated the edges of tints must be carefully finished so that they will blend or connect with other tints without showing a joint. Rounded edges, where two surfaces join and form a hard line, are softened with the air brush, as in case of large fillets; where the edges are almost sharp, the rounded edges may be produced by using a medium-gray color and striping a fine line between the adjoining tints.

10. It often happens that details are rather indistinct on the dark side of the object, and if this side is to be intensified, the detail will be obscured by the color that is put on. It is, therefore, advisable to go over these parts with a lighter color before adding the air-brush work. It should be the aim of the retoucher to have as few friskets as possible, and the first frisket cut should include as many of the parts to be air-brushed as possible, so that the work may be continued without interruption. This not only saves time, but it is an advantage for the retoucher to be able to compare as many parts with one

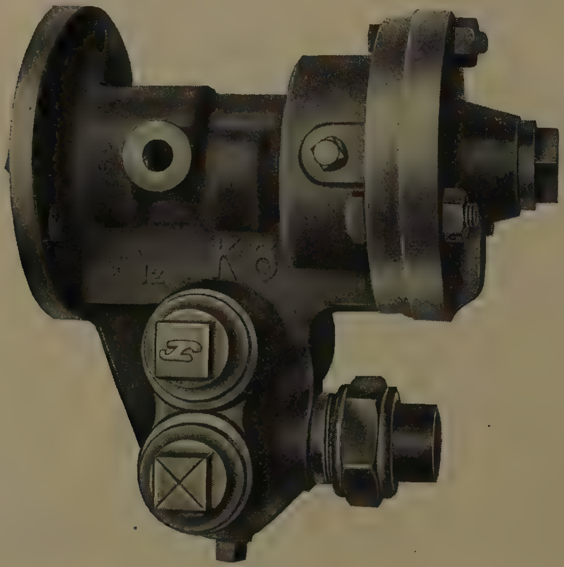


Fig. 14

another as possible. It is necessary very often to lift the edge of the frisket to judge the exact color of a tint in relation to another tint, but the more experienced a person becomes, the less this will have to be done.

If the air brush is working properly, small details may be put in with the air brush without a frisket, particularly when a succeeding tint is painted by hand to sharpen the outline. Many small tints are easily put in by hand, quickly and smoothly enough to match the work of the air brush. In Fig. 14 is shown the triple valve completely retouched.

11. Blowpiping Outfit.—A halftone illustration, combined with line work, was required to show a blowpiping outfit.

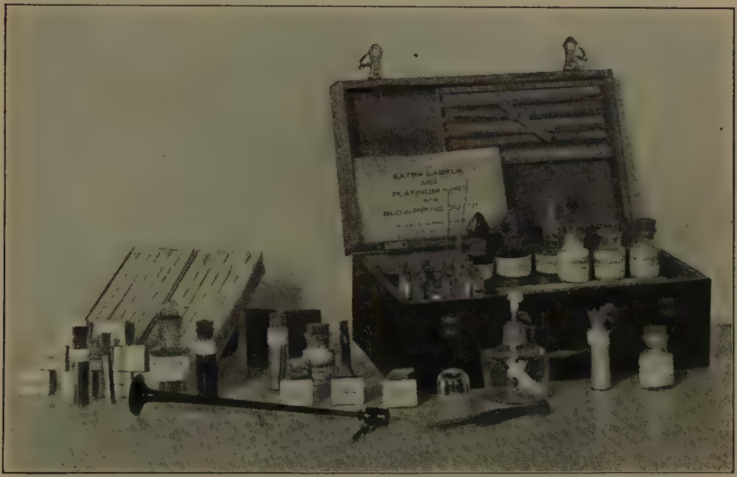


FIG. 15

An advertising man furnished the articles, which were arranged as shown in Fig. 15. As the background is to be in the form of a circle, the unmounted photograph, Fig. 15, is cut to that shape, leaving enough paper on the lower part of the photo for vignetting. This photograph, without retouching, will appear weak in the reproduction, so the black portions are intensified with process black and high lights on the bottles are painted pure white to give brilliancy. The medium tones

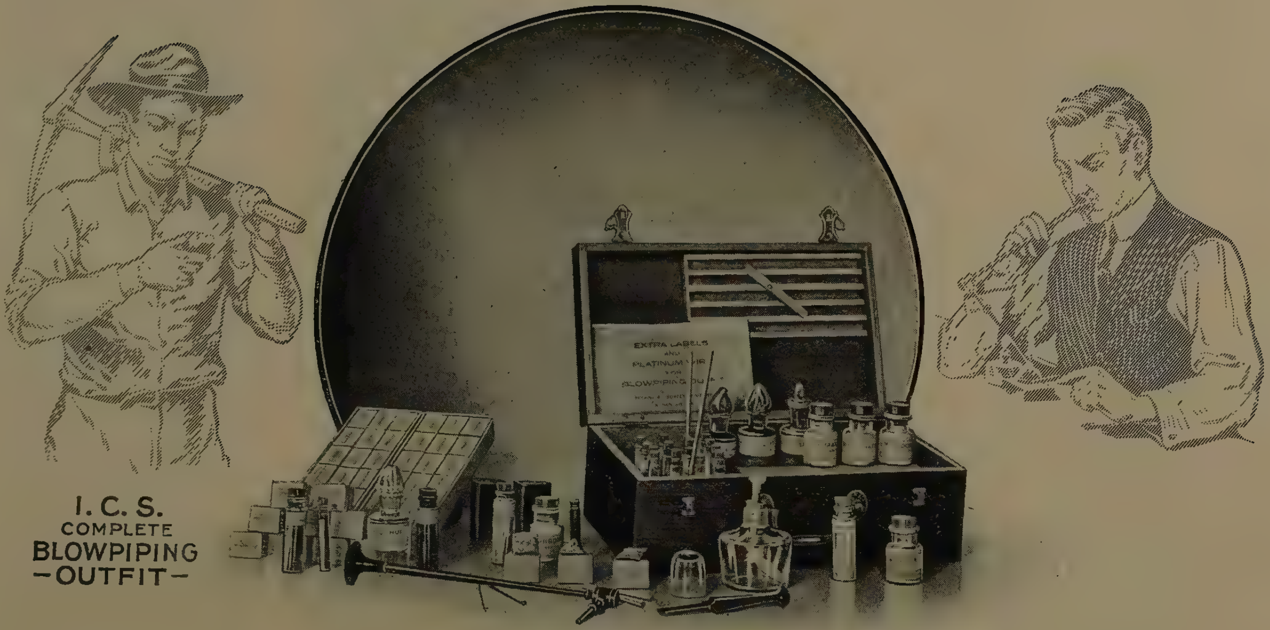

EXTRA LABELS
AND
PLATINUM
BLOWPIPING
I. C. S.
COMPLETE
BLOWPIPING
-OUTFIT-

FIG. 16

are produced by mixing ivory black and white together and adding a little sap green to overcome the bluish tone and to match more closely the black and white photographic print.

Only one frisket is necessary to protect the articles when tinting the background. The lower part of the photograph is comparatively light in color and the vignetting is easily done without a frisket. The balance of the retouching is hand work. The halftone reproduction is made with No. 133 screen, as shown in Fig. 16.

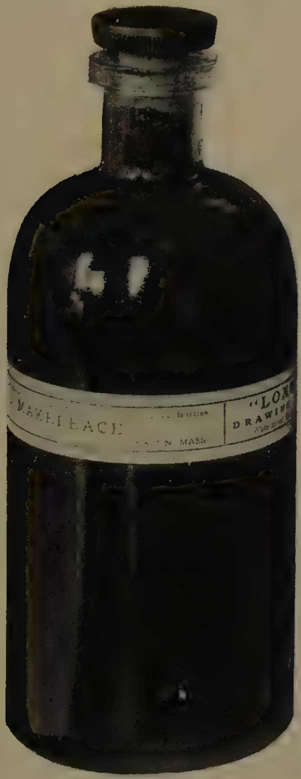


FIG. 17

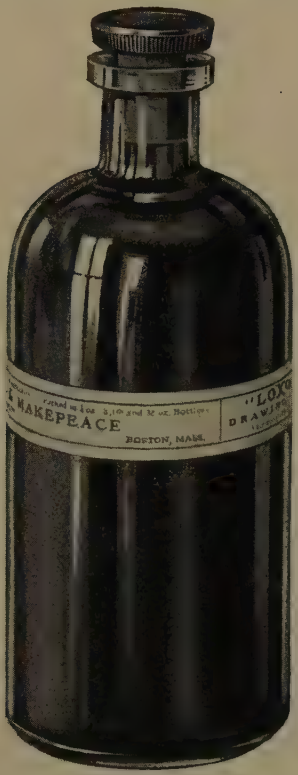


FIG. 18

The figures representing the miner and the assayer, as well as the lettering, are drawn in black ink. The figures, however, are made to occupy a subordinate position through being given a subdued effect by the gray process, which is described below.

12. Producing the Gray Effect.—The gray effect, a specimen of which is shown in Fig. 16, may be produced in two ways. In one, negatives of various tints, composed of lines or dots, are superimposed over a line negative of a drawing made with black-ink lines. As all black lines and solids show as clear glass on a line negative, when a negative tint is combined with it a gray effect composed of lines or dots is produced.

In the other method, a thin piece of cardboard or metal, called a *diaphragm*, containing a diagonal slot is placed in the lens mounting of the camera. During an exposure, this slot so diffuses the light that it cuts out the opposite series of diagonal lines of which the halftone screen is composed. A piece of white cardboard is then placed on the copying board and a short exposure made. This cardboard is then replaced, on the copying board, by the drawing that is to be reproduced, the halftone screen is removed from the plate holder, and another exposure made of the wet plate.

13. An Ink Bottle.—A reproduction of a photograph of a bottle of ink is shown in Fig. 17. This photograph has not been retouched, and while the subject itself is black, the reproduction of a black mass practically unbroken by middle tints, hardly appears interesting or attractive. The retoucher who has a good knowledge of light and shade may greatly improve the effect by breaking up the solid masses into dark or medium tones and putting in strong, definite high lights, so that a smooth polished surface is suggested.

Very little air-brush work is necessary and no frisket is used, the former being carefully confined to the space worked on, the hand of the operator being guided by a straightedge. A reproduction of the retouched photograph is shown in Fig. 18. All the medium tints used to break up the large black masses of color are painted in by hand. The milling on the cork is defined and the lettering and rules on the label strengthened.

A retoucher will be guided by the amount a subject is reduced. The greater the reduction, the broader and simpler the treatment. This element should be taken into account, as it not only saves time, but the result is much better. Details that may look very fine on a large retouched photograph become lost and cut up by the halftone screen when the subject is greatly reduced. There is no rule for determining a method for treating a subject according to the amount of reduction, experience being gained only by practice and studying of good examples.

14. Outfit of Chemical Apparatus.—In Fig. 19 is shown a photograph, with a dark background, of an outfit of chemical apparatus. As a square-finished halftone is required, this background is blended with the air brush. For most of the small bottles, the photographic color is most suitable. A frisket-paper mask is laid on the photograph and cut around the bases of the lower row of bottles and around such parts as are to be protected. Those parts that appear to be the desired color of the background, such as the space between the tripod legs and the space between the tubes at the left, are unprotected by a frisket. Other parts requiring a complicated cut-out frisket are retouched without a mask, as the background is almost the desired color. The thin color is sprayed over these parts, which leaves the details sufficiently visible so that a few touches restore them to their original color.

White is mainly used, the high lights producing the strongest effect with the least amount of labor. The glass tubes and receptacles shown on the upper step are practically the color of the background, the high lights being the only parts that are sharply defined. These objects are, therefore, strengthened with a darker color around the edges to contrast stronger with the background. By comparing the reproduction of the original photograph with that of the retouched one in Fig. 20, a good idea of the treatment can be obtained. The halftone plate has also been tooled in the high lights.

15. Heavy Iron Castings.—In Fig. 21 is shown a reproduction of a photograph received from a manufacturer, who desired a halftone engraving, all lettering and numbers to be omitted except those on the finished illustration, as shown in

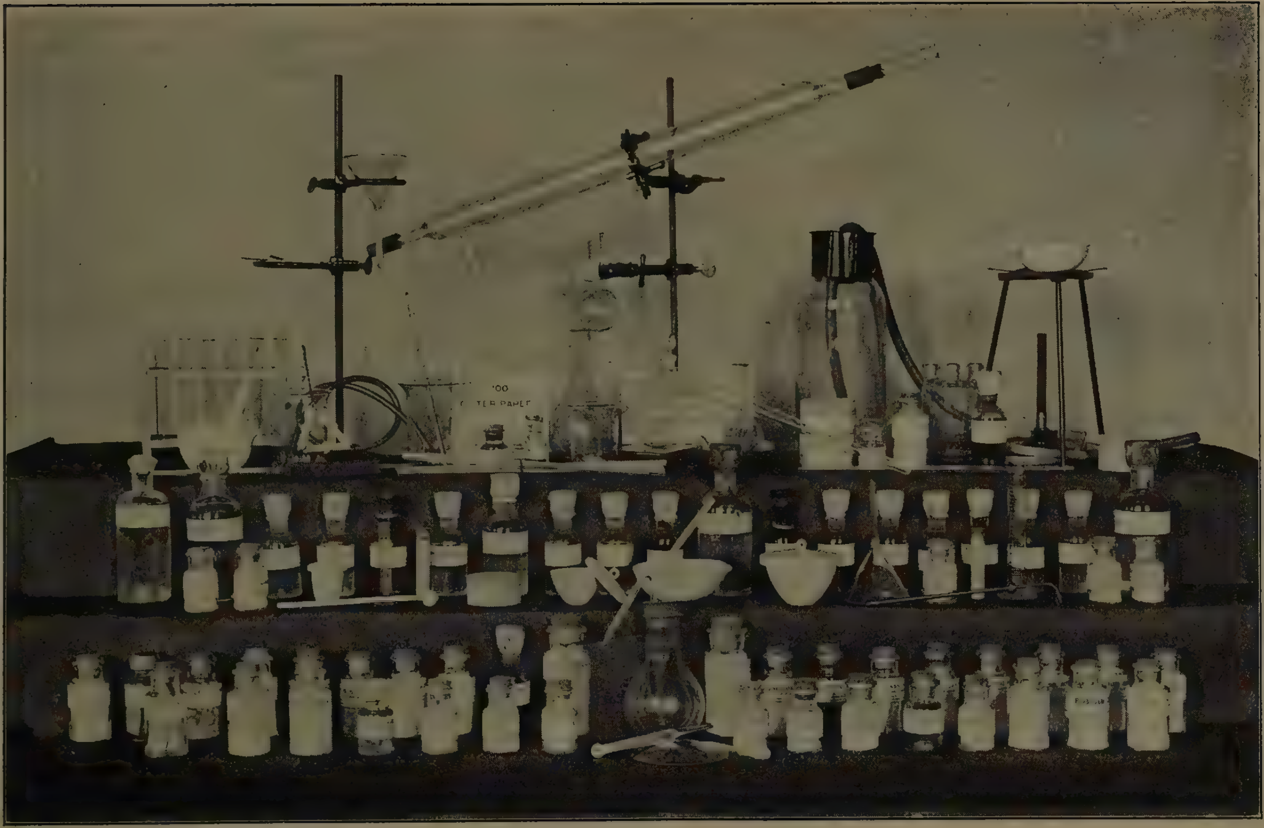


Fig 19

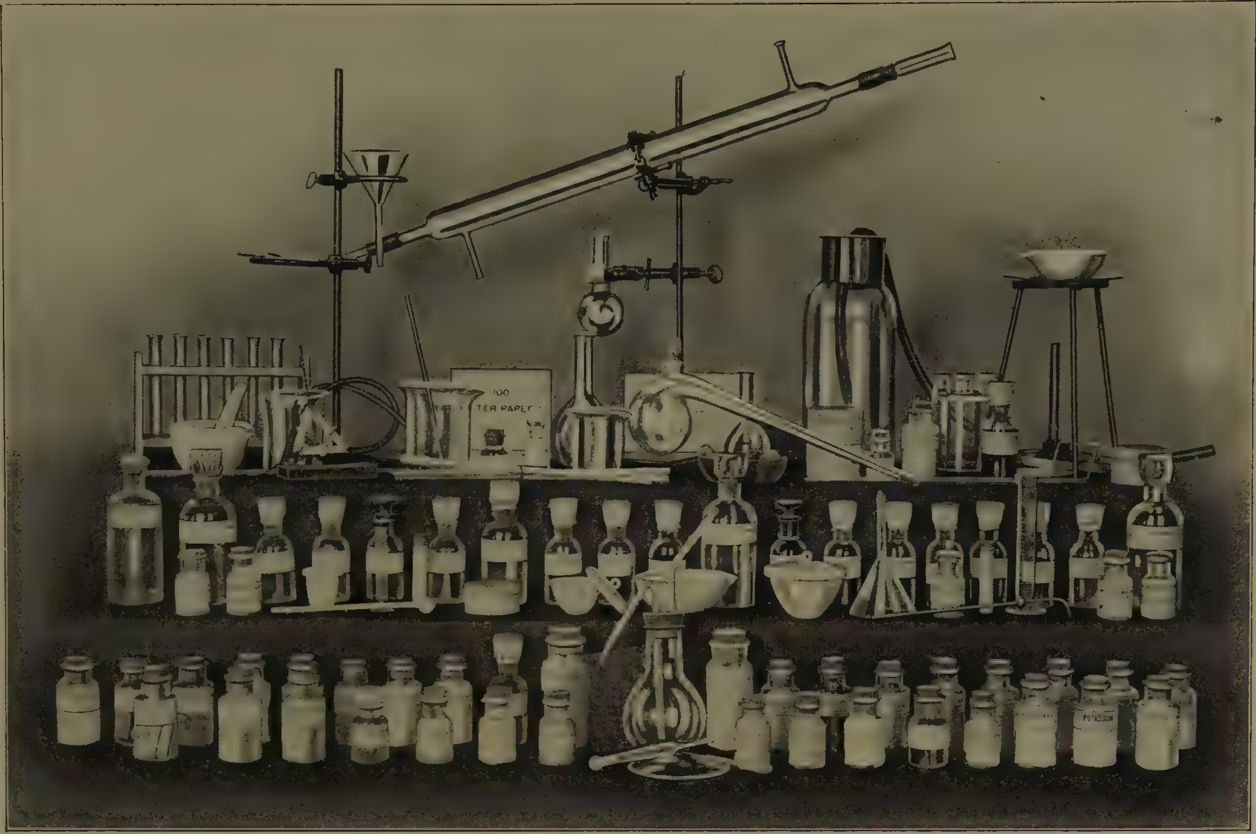


Fig. 20

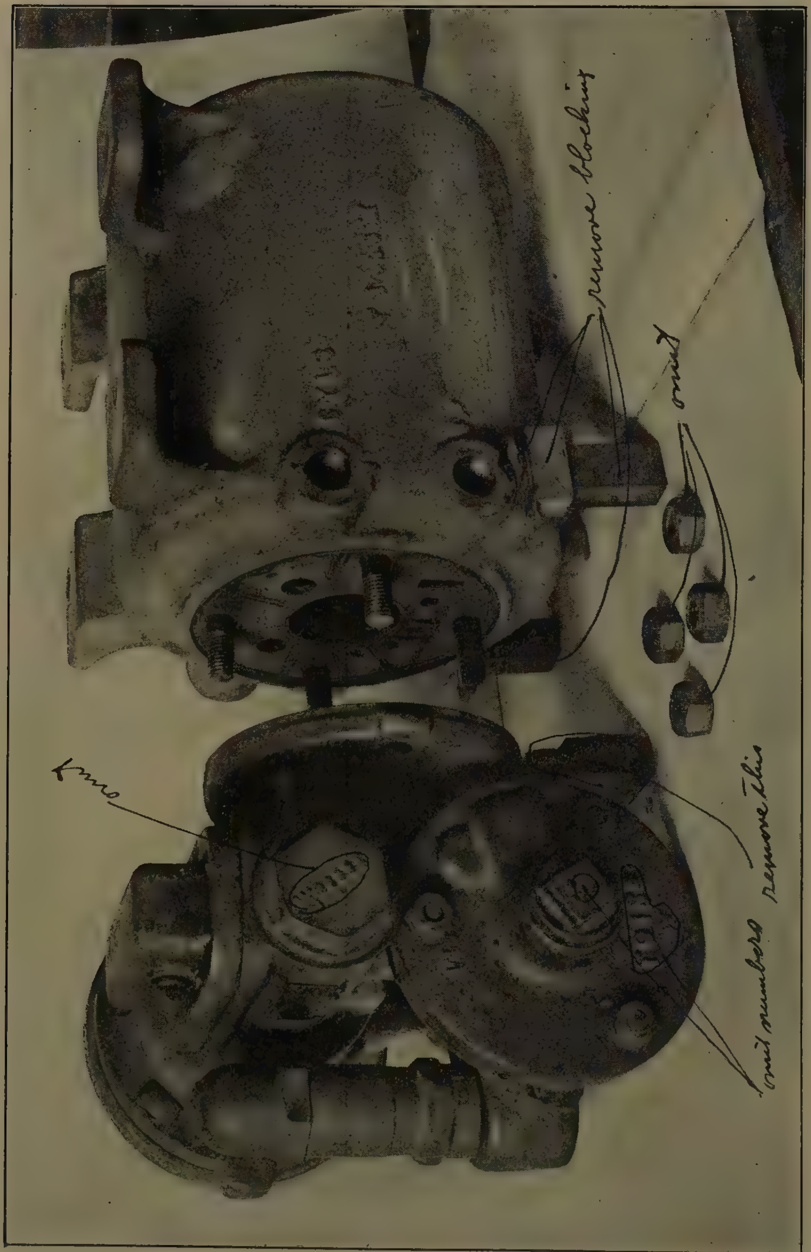


FIG. 21

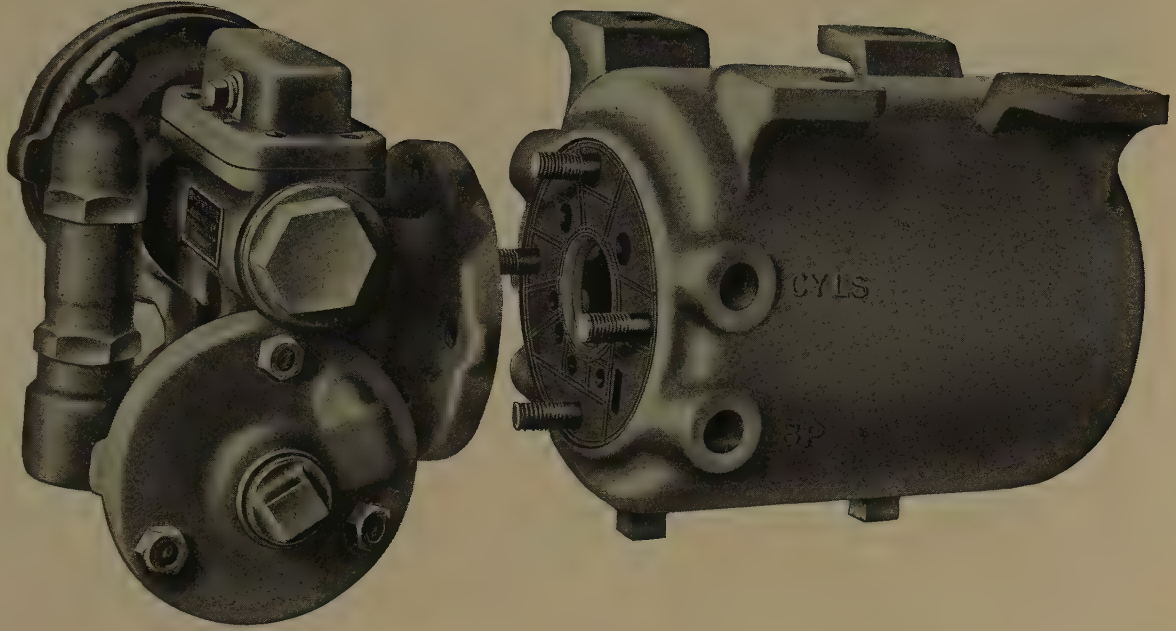


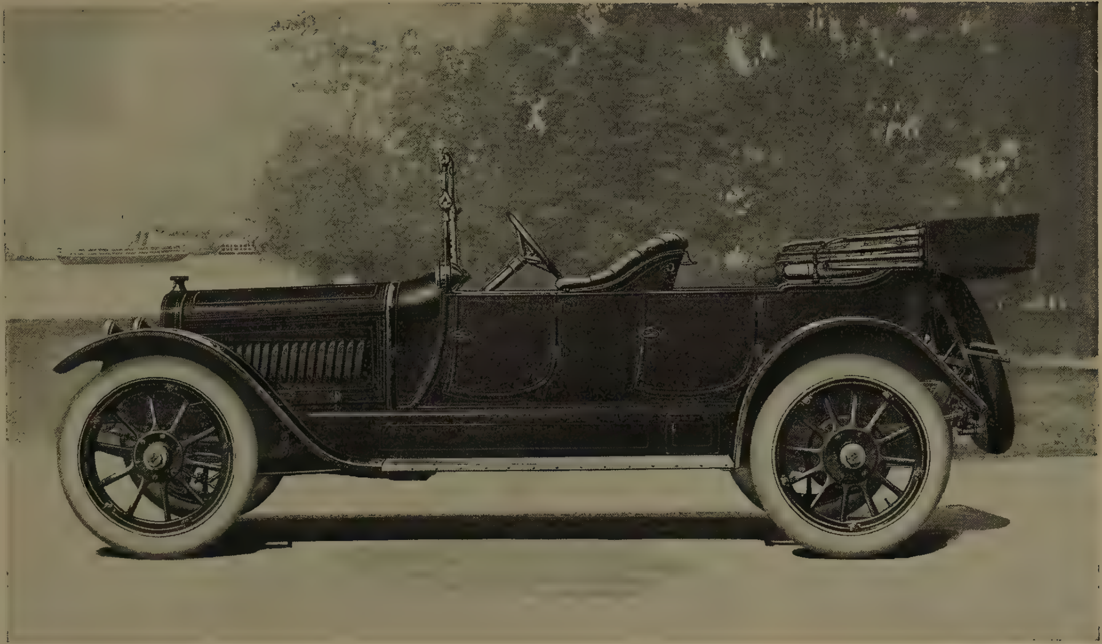
FIG. 22

Fig. 22. The nuts, as well as blocking used to support the casting when being photographed, are to be removed and the halftone is to have the background cut out. The surfaces are to be retouched so that the object has a smooth dull finish, and the general color of the material is to be maintained, which in this case is cast iron.

Each retoucher of photographs has ideas of his own as to the number of friskets to be cut and what may be put in first to best advantage. The skilled air-brush operator can do very small parts without a frisket, especially if the air brush is in perfect working condition. The main object, as a rule, is to save as much time as possible. In commercial work, the manufacturer is not always willing to pay a high figure and the work is usually wanted quickly.

By comparing the original copy furnished, Fig. 21, with the retouched example, Fig. 22, it will be noticed that the artist has to produce a stronger light and shade effect than that shown on the copy; otherwise, the subject will appear flat. When treating mechanical subjects, the artist may secure a better perspective effect by skilfully grading the values. The retouched photograph was three times larger than the illustration shown.

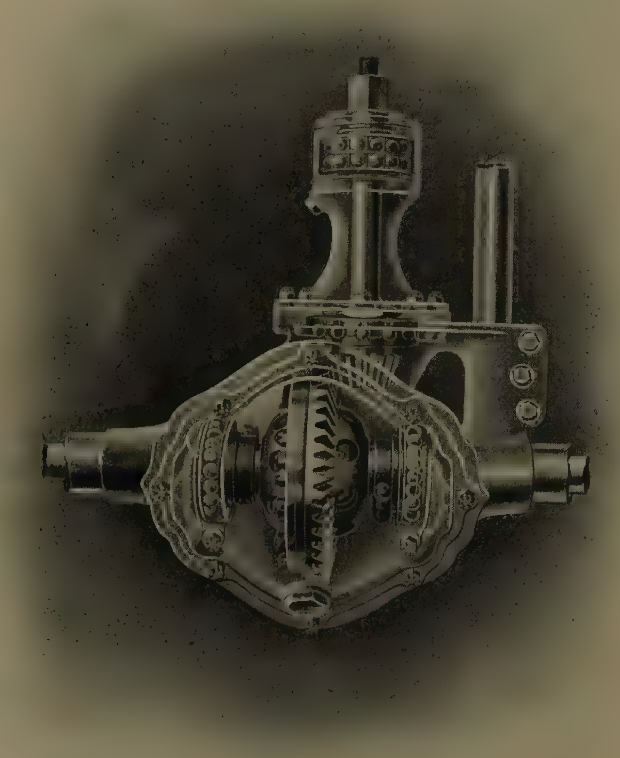
16. Automobile.—The automobile industry requires its product to be illustrated very profusely, as a rule, and the sales, in a measure, depend on attractive illustrations. The retouching and drawing necessary to produce artistic catalogs for these concerns furnishes employment for a great many artists. The illustration of the automobile shown in Fig. 23 at first sight appears like a retouched photograph, but in this case a drawing is made from a blueprint and wash and body color used to produce the modeling. The background is also painted in to imitate a photographic effect. Both hand painting and air-brush work are necessary to produce the drawing. The background is painted in by hand, and to keep it subordinate, so as not to detract from the automobile, a thin tint of white is sprayed over it, the car itself being protected by a frisket. It might seem to many as if this were a waste of



By courtesy of Lozier Motor Car Co.

FIG. 23

time and money, but is in reality not so when one takes into consideration that the view of the automobile is an easy one to lay out. Further, if photographed from the car itself, in all probability the body of the car would have appeared



By courtesy of Stevens-Duryea Co. FIG. 24

distorted by reflections, and lacking in details, and perhaps an unsuitable background would have to be removed. A drawing of this kind should be made about three times larger than the illustration shown.

17. Method of Producing Phantom Views.—Transparent, or phantom, views, as they are sometimes called, are very attractive as catalog illustrations. They serve to illustrate subjects that would be difficult to show in any other way. The illustration shown in Fig. 24 represents the transmission gearing of an automobile as it would appear if the casing were transparent. To produce this result, the artist is usually furnished with blueprints or photographs, and sometimes models from which to construct the drawing. This class of work requires careful sketching, as alterations are difficult to make after the work has been retouched.

The usual method adopted in painting or air-brushing such subjects is to make the part that is desired to be most prominent appear opaque, shading it in the regular way, paying no attention to the transparent parts. In this subject the gearing and ball bearings are the main things to be shown, which are painted in full, after which the casing is treated in gray tones, and certain light lines governing the general form of the casing are drawn across the full parts previously painted, which is done usually with white, thus producing transparency. The dark vignetted background also adds greatly to the transparent effect, and emphasizes the high lights. The background should be made subordinate to the blackest portions on the shadow side of the details of the machine, unless the subject is of light-colored material. It is to be understood that each subject, in a measure, requires special consideration, but the foregoing directions will apply in many cases.

18. Window Display of Merchandise.—Displays of merchandise in shop windows are sometimes very difficult to photograph on account of reflections from the buildings on the opposite side of the street. The color of the materials or decorations may be either too dark or too light to furnish sufficient contrast for making a first-class halftone. A subject of this kind is shown in Fig. 25, which gives the appearance of a photograph that has not been retouched. By referring to Fig. 26 the same photograph is shown after retouching, thus showing the appearance of the finished illustration. Photographs of

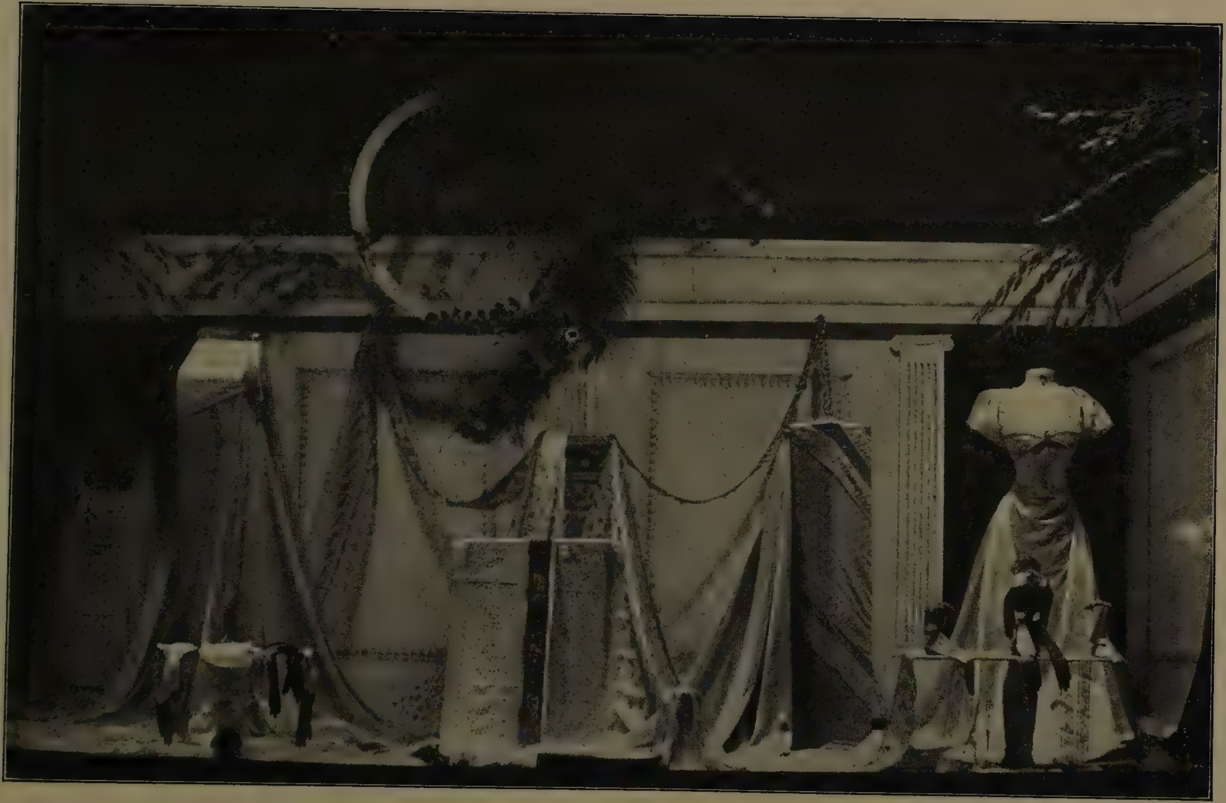


FIG. 25

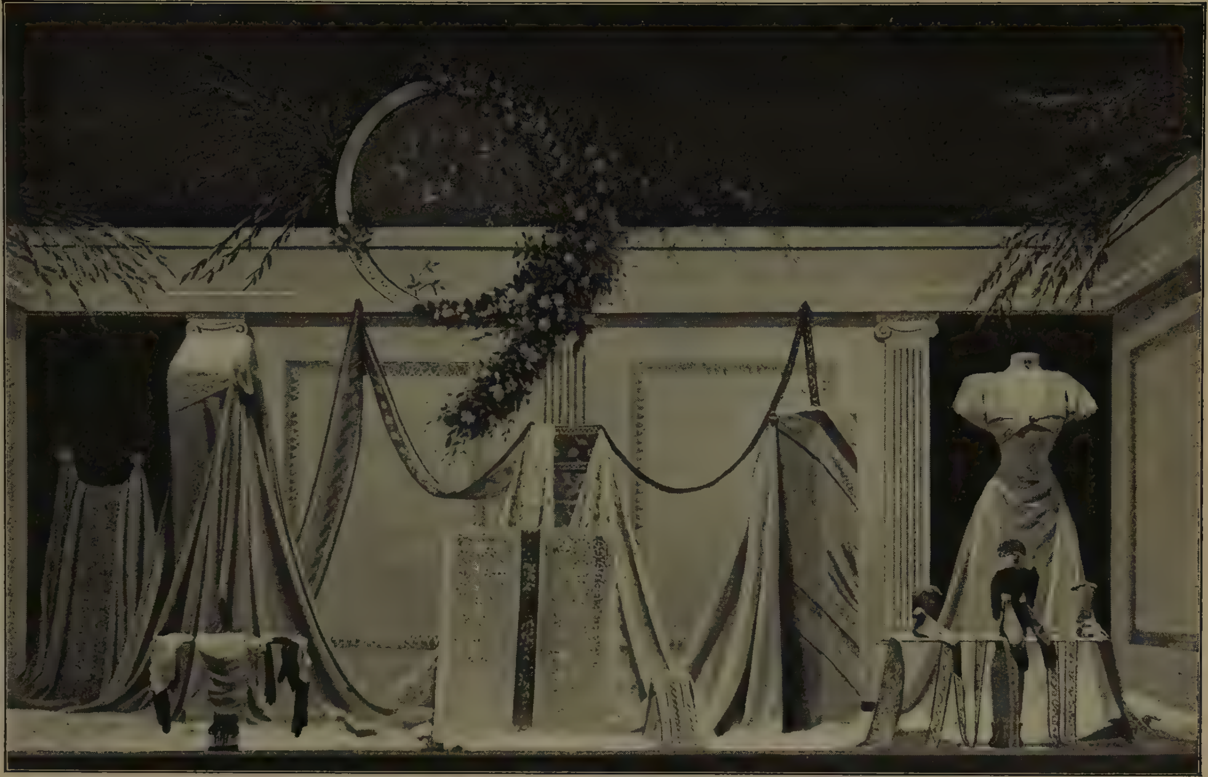


Fig. 26

this kind require considerable hand painting, and the artist should not depend too much on the air brush, as many subjects are likely to come to hand requiring this kind of treatment.

19. Drawing Instruments.—A drawing-instrument set, as shown in Fig. 27, usually requires retouching, as the photographer, when making the exposure, places such subjects in a position to avoid the direct light, on account of halation caused by the polished instruments. The photograph consequently appears a trifle dark, but full of detail. The high lights on the instruments are first painted in by hand. The leather case is a medium-brown color and photographed rather dark, so it is necessary to paint a flat tint around the sunken parts containing the instruments. This is also done by hand, as the spaces are comparatively small and could be done more quickly than by cutting a frisket. The flaps, however, are tinted with the

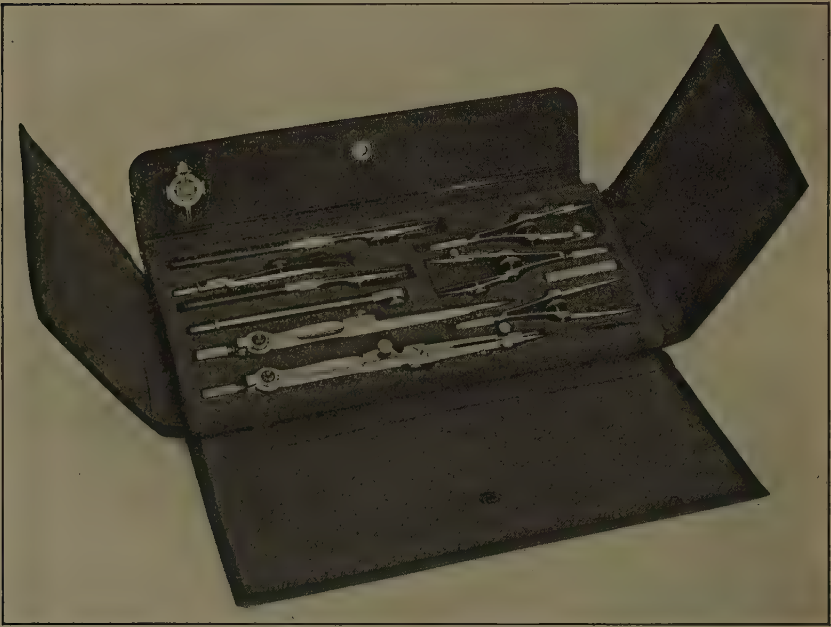


FIG. 27

air brush, the dark binding strengthened in value and a fine line in light gray striped around the edges to bring out the thickness of the leather covering. The lettering is painted in white on the photograph. A little vignetting is added to avoid a hard cut-out appearance. The retouched photograph is 9 inches wide and reduced to the size shown in Fig. 28. When subjects of this kind are to be printed on a cheap grade of paper, a vignetted cut is not desirable, as the edges usually print hard.

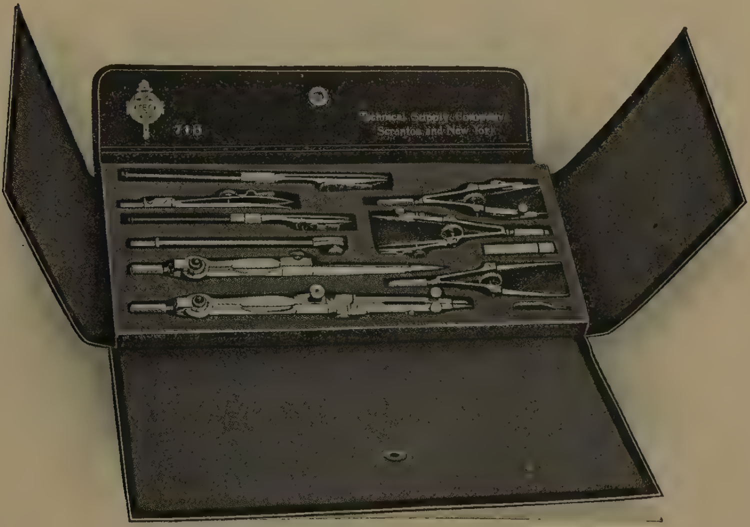
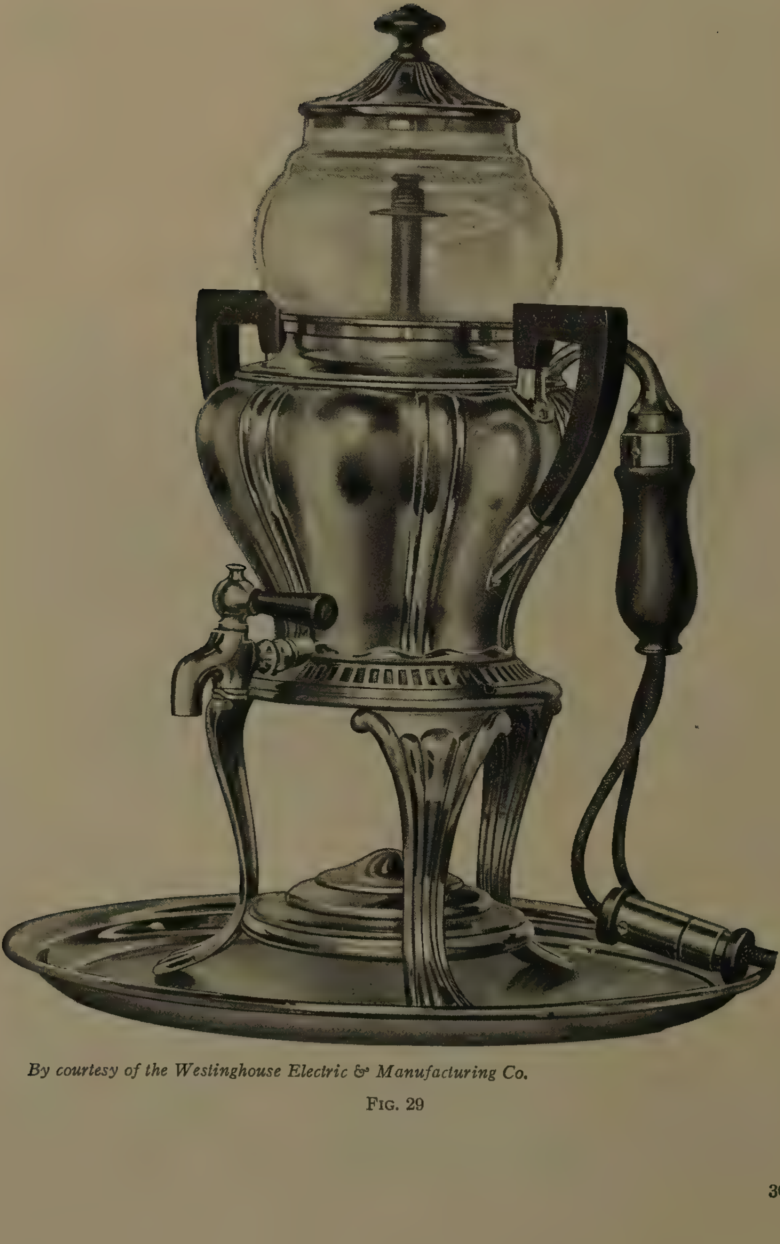


FIG. 28

20. Coffee Percolator.—A carefully retouched photograph of a coffee percolator is shown in Fig. 29. The surfaces of the article are highly polished, and the photograph without retouching appears weak and distorted by reflections, and conveys a poor impression of this nicely finished article. The handles are made of ebonite, but they photograph very black. The painting of the reflections required to produce the desired effect without creating a distorted appearance of the object requires artistic ability in hand painting and dexterity in the use of the air brush. The engraving is carefully reetched and



By courtesy of the Westinghouse Electric & Manufacturing Co.

FIG. 29

burnished and the high lights are tooled, so that the same brilliant effect is obtained as that shown on the original retouched copy. The retouched photograph was made double the size of the illustration. This example may be used to refer to when retouching polished surfaces, such as silver, tin, nickel, or copper.

21. **Ship's Compass Mounted.**—A subject that is polished and made of dark material may be treated as shown in Fig. 30. Considerable dark pigment is used and reflections and high lights must be carefully studied, so that the form of the surfaces may be brought out and the material from which it is made suggested. The cylindrical parts have been made with an air brush, and in some places the highest light striped in by hand, using a brush along a straightedge for the cylindrical parts.

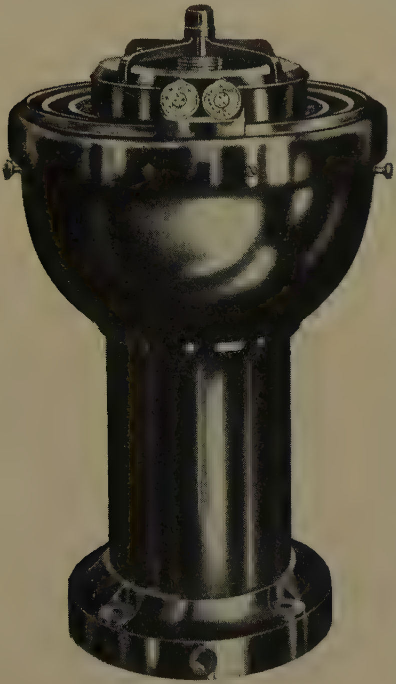
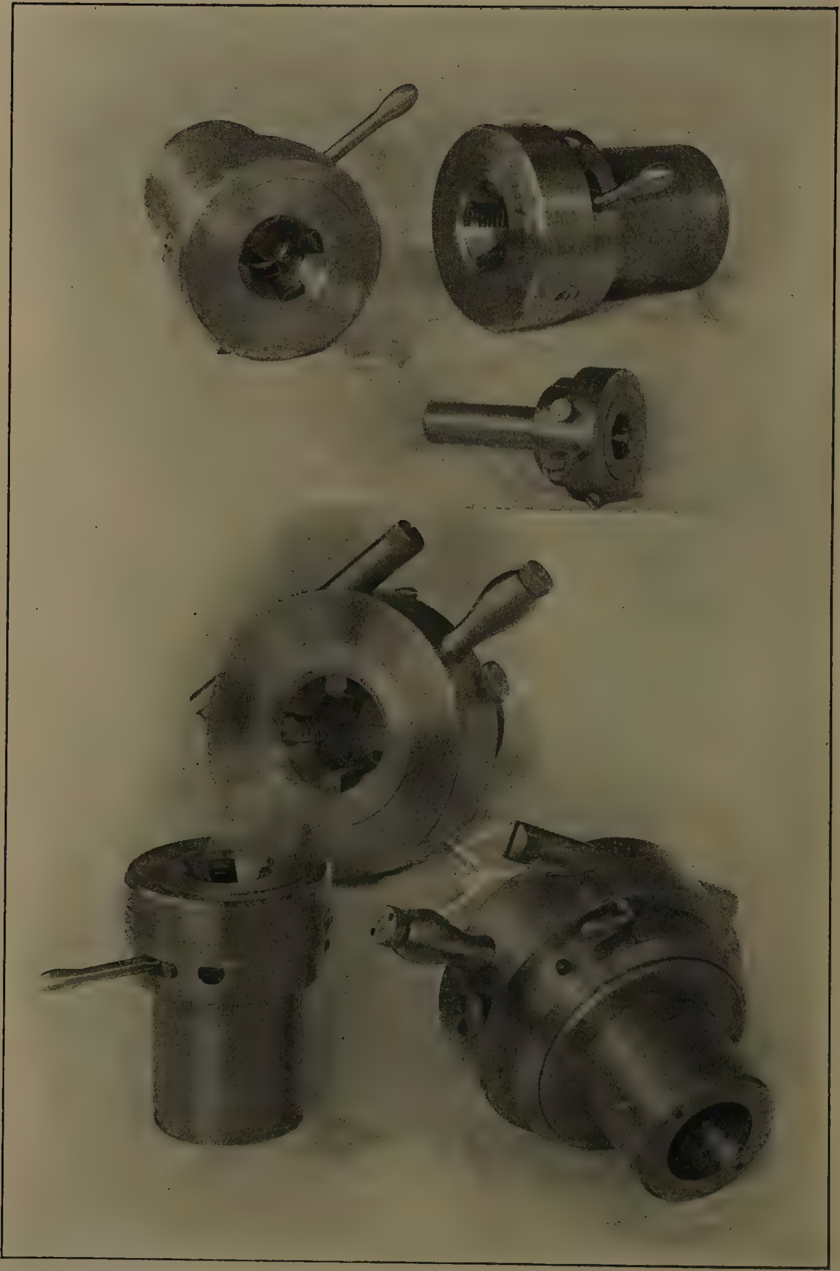


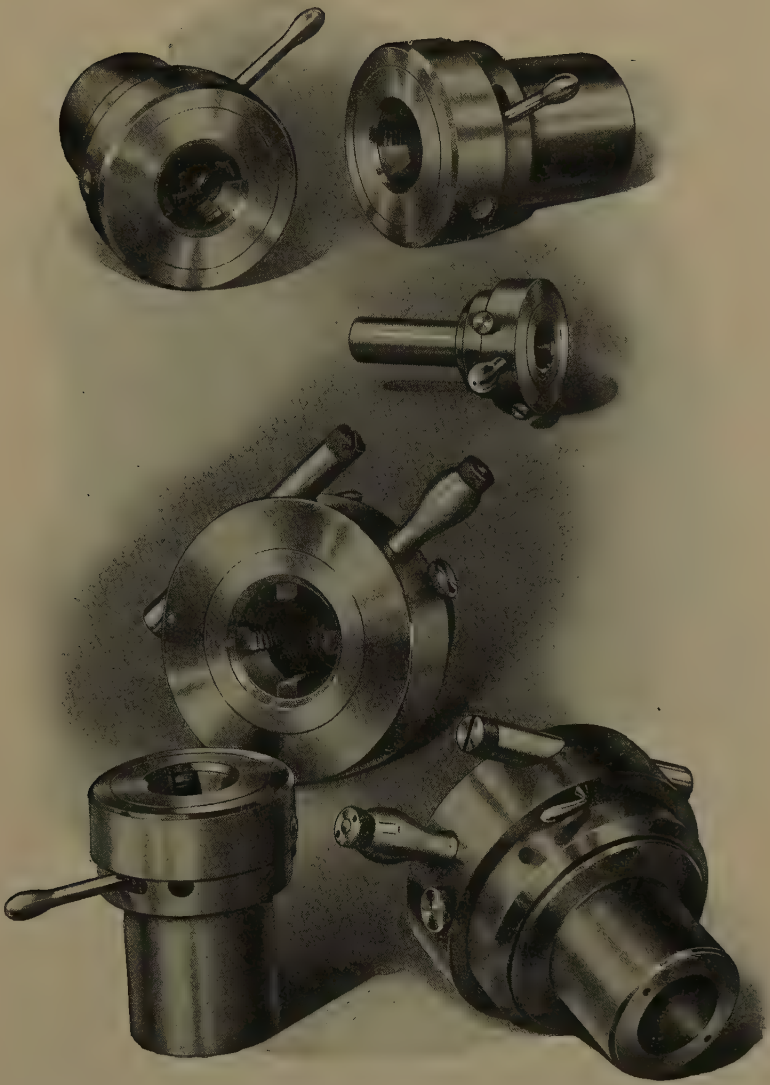
Fig. 30

22. **Polished-Steel Machine Tools.**—In Fig. 31 is shown a combined reproduction of two photographs of machine tools made of steel and highly finished. A reproduction made directly from these photographs will result in a poor halftone, devoid of contrast, and will not represent the high-grade articles advertised. It is therefore necessary, after combining the photographs, to go over the surfaces with air-brush work, keeping such reflections that are advantageous and increasing the depth of the shadows, making the high lights more brilliant. The background is



By courtesy of Jones & Lamson Machine Co.

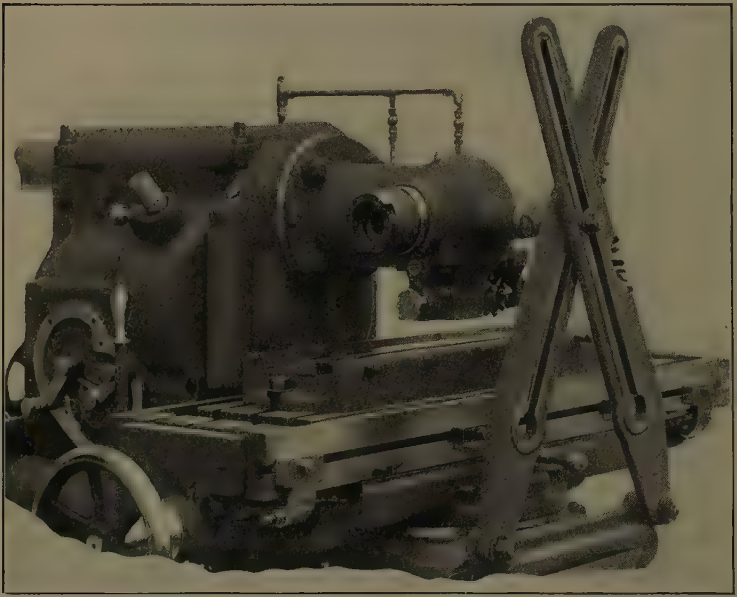
FIG. 31



By courtesy of Jones & Lamson Machine Co.

FIG. 32

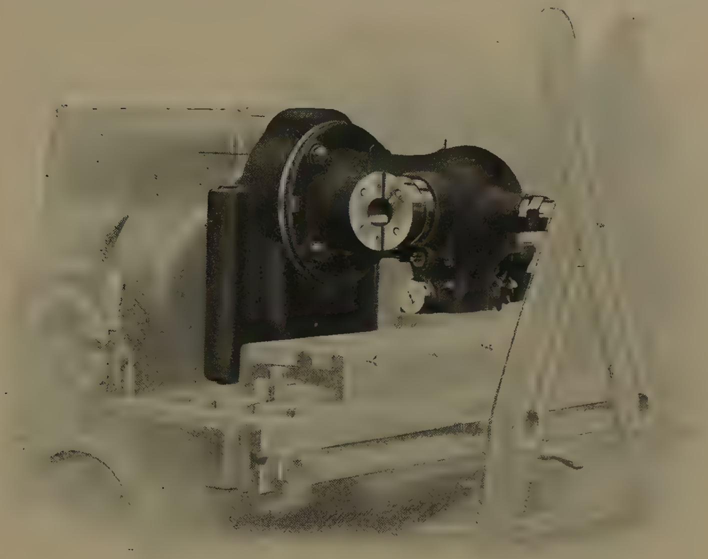
shown vignetted, and is made smooth, all evidences of torn parts and joinings of the original photographs being eliminated. This smooth background also helps to emphasize the effect of high lights and reflected lights on the parts of the objects. The shadows of the objects cast onto the background produce variety and connect the subjects, so as to form an interesting composition. The original retouched photograph was double the size of the illustration shown. The friskets have to be carefully cut, so that all ellipses are perfectly formed. The finished illustration shown in Fig. 32 represents a high-grade specimen of retouching, and is a good example to refer to when treating similar subjects.



By courtesy of Kearney & Trecker Co. FIG. 33

23. Emphasizing a Certain Part of a Machine. Various methods are devised to illustrate the manner in which a device is used or attached, so that the prospective buyer may see and understand its purpose at a glance. To show a mechanical device that is attached to a standard machine, the reproduction of the photograph shown in Fig. 33 would not convey to the purchaser what is for sale, and if the attachment were shown separately it is a question whether the use of the part would be sufficiently understood.

By treating the subject as shown in Fig. 34, the article advertised is brought out prominently, the subject being treated strong in contrast. All parts having finished surfaces are treated light in color, while the casting, shown in dark color, is delicately modeled. The light gray effect of the parts of the machine surrounding the attachment is produced by protecting with frisket paper the portion to be kept dark, and spraying the exposed surface with the air brush, using thin white and making it subordinate to the attachment. The standard machine having been thus reduced in prominence, the details are defined by using a medium color for striping, so as not to interfere with any part of the attachment. The effect is then improved by the engraver, who tools the high lights



By courtesy of Kearney & Trecker Co. FIG. 34

on the parts shown in the foreground and retains the same effect as appears on the drawing.

24. Pair of Opera Glasses.—It is advisable, when retouching a photograph, to suggest in a characteristic manner,

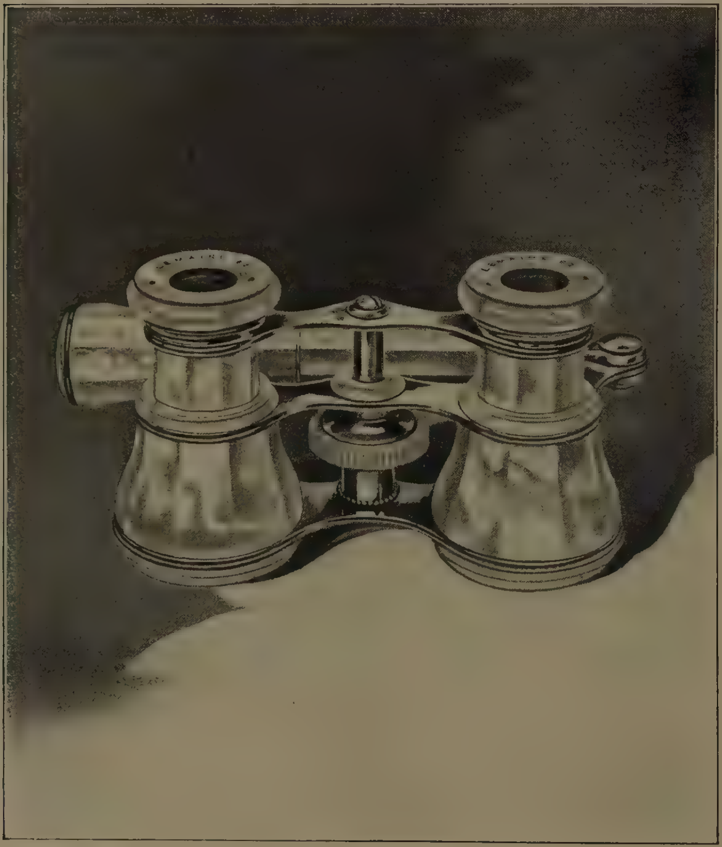
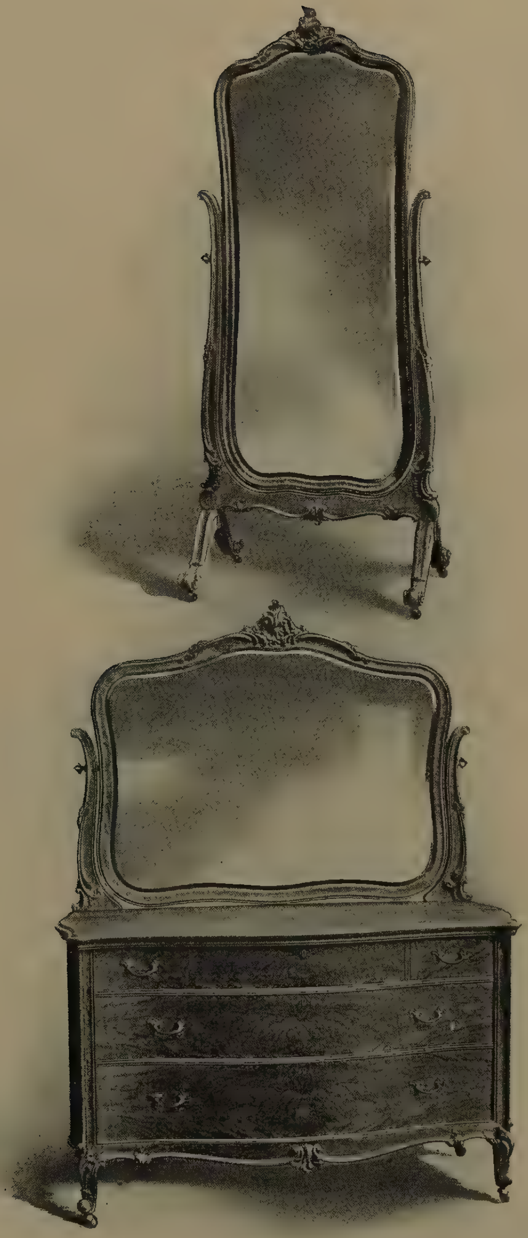


Fig. 35

if possible, the material from which an object is made. In some instances this can be more easily done by using a background of a suitable tint. In Fig. 35 is shown a pair of opera glasses that is treated in a manner suggesting very nicely the



By courtesy of Berkey & Gay, Grand Rapids, Mich.

FIG. 36

material from which it is made. The pearl effect is brought out by using reflections and keeping the shade parts light in color, so as to contrast strongly with the metal portions. The background greatly added to the effect, and the manner in which a bold mass of light in the foreground contrasts strongly with the dark gray ground helps the effect. The background has not been made a smooth, unbroken mass, but has been partly painted over by hand, and then lightly blown over with the air brush, leaving a shadow more or less defined, thus avoiding the effect of a smooth and monotonous air-brush background.

25. Furniture.—Photographs of furniture illustrations, as shown in Fig. 36, usually need retouching, particularly if the furniture is made of dark material or if it has a dark finish. The moldings will probably need striping, in either a light or dark color, depending on the character of the photograph. Mirrors, almost without exception, need retouching. In this case the mirrors have been sprayed with the air brush, which merely produces an even gray tone, and the real effect is accomplished by dexterous strokes of white, painted in with a broad flat brush. The vignetted ground work is put in with the air brush.

26. Shoes.—Shoe manufacturers require illustrations that show the form of the shoe, texture of the leather, and stitching, in an ideal manner. A photograph made directly from the shoe itself does not bring out all these points. The manufacturer, therefore, had in this case a drawing made from the shoe that is conventionalized by the artist so as to produce an attractive illustration, as shown in Fig. 37.

The illustration of a tan shoe is printed in orange and black, but only the method of preparing the original of the black plate will be described. A pencil sketch is made of the shoe, and the texture is produced by photographing a separate piece of leather. This photograph is then cut to fit the spaces on the shoe and carefully pasted in place. The form of the shoe is brought out by using the air brush to darken the leather parts, and the stitching, lacings, and metal parts are then added.

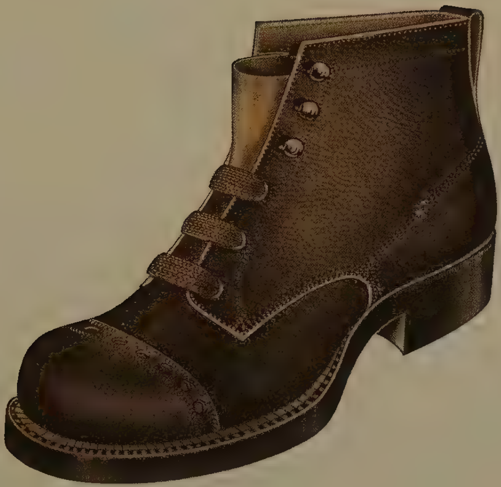


FIG. 37 286-I L T 149 § 22

shows the same photograph after retouching. The tiles have been put in, as well as the lamps on each side of the mirror. The tiles on the background and floor have been made grayer in tone, thus bringing out the porcelain basin in relief. The nickel fittings are darkened and bright high lights bring out the effect. The mirror is tinted over with the air brush, and a little hand work with the brush conveys the realistic appearance. The beveled edge of the mirror also receives attention.

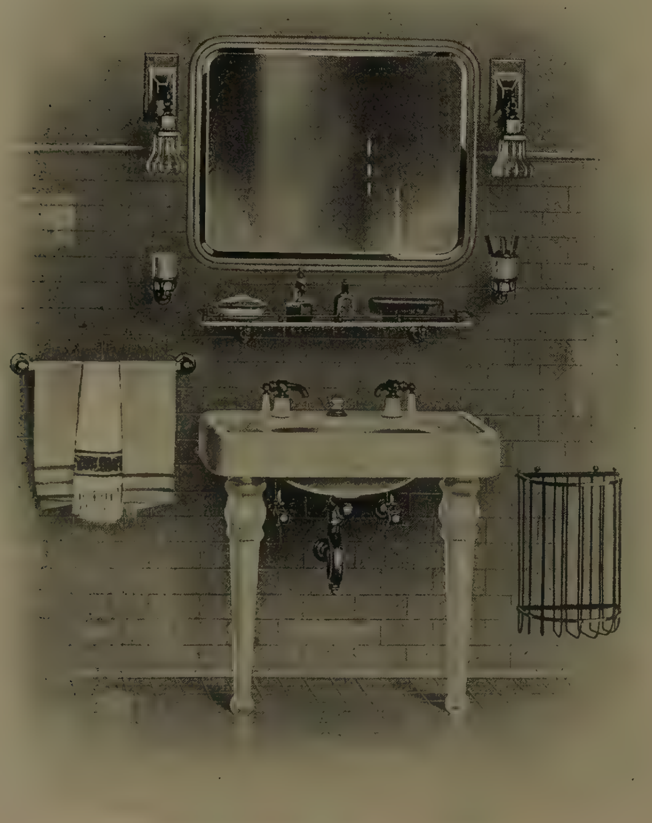


Fig. 39

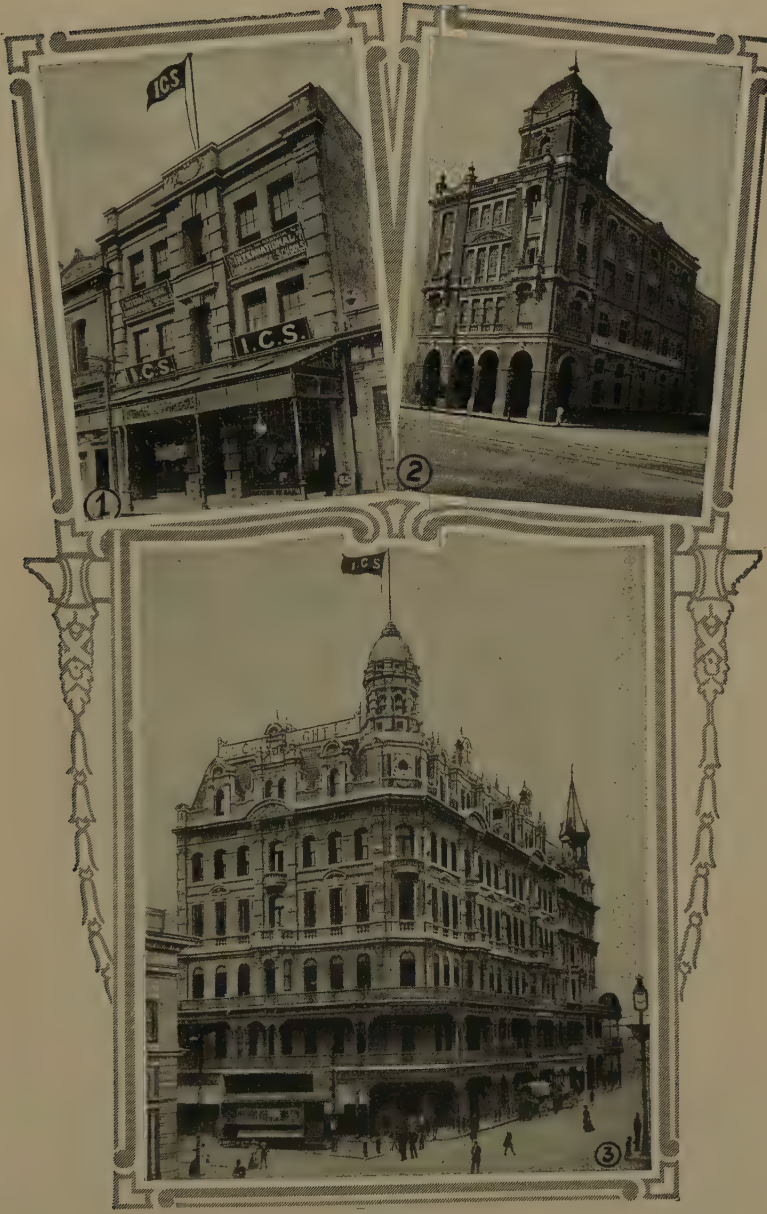


FIG. 40

Practically the entire photograph has been treated, so that very little of the original photograph shows.

To attempt to describe all the methods adopted by retouchers to produce an illustration of this kind would be difficult. Each retoucher, as he becomes skilled in his work, finds out ways by which he may produce a certain effect easily and quickly, so that his work bears his own individuality.

28. **Buildings Grouped With Ornament.**—A halftone showing a group of buildings is given in Fig. 40. In this case a design was prepared to combine in one engraving three buildings, as shown. The ornamental arrangement was produced from a drawing made in black ink, the gray effect being produced by the engraver. The photographs were of different sizes, so that they had to be reduced separately and inserted in the negative of the ornamental work. The photographs were carefully cropped in proportion to the panels they were to occupy, so that when reduced they would fit into the ornamental arrangement.

The photograph of the building shown in the lower panel appeared weak in the upper part, caused by halation from the sky when the photograph was made. To increase the contrast and bring the building out more prominently, the sky, which was light gray in tone, was air-brushed with white and the details of the light parts of the building strengthened with a darker color. This produced a uniform tone over the entire building and made a satisfactory reproduction.

RETOUCHING PORTRAITS FOR REPRODUCTION

METHOD OF RETOUCHING USED FOR PORTRAITS

29. Preparing Photograph to Receive Air-Brush Work.—As in the case of retouching for catalog illustrations the method of retouching photographs from which halftone illustrations are to be made can best be explained by presenting specimens of such photographs, before and after retouching, and describing how the work was done.

In Fig. 41 is shown a photograph just as it was furnished to the retoucher. Instructions were given to reproduce it in halftone and partly silhouetted and vignetted in style. This portrait was to appear in a booklet with others similarly treated. *Vignetting* a photograph means retouching it so that the edges of the subject fade away or blend into white paper. *Silhouetting* a photograph is to cut away the background, leaving the subject sharp in outline against the white.

The retoucher first prepares the photograph by rubbing gelatine over the surface with a small piece of absorbent cotton and then placing a piece of prepared frisket paper in contact with the surface of the photograph. The frisket paper is cut in the usual manner and removed from the parts that are to be treated with the air brush. In this case the entire portrait is protected when the background is put in.

30. Retouching Background and Face.—As the tone values in the photograph furnished are black and white, the retouching is done with ivory black and white, to which is added a little sap green or sepia to overcome the bluish effect produced when black and white are mixed together. The main portion of the background is put in with white, and to avoid a hard, cut-out appearance and assist in getting atmosphere and roundness to the portrait, a light blended tint is put in the background above the shoulders and along the dark side of the face. The frisket paper is then removed and an air-brush tint blown over the lower part of the coat, thereby softening the edges with a tint that blends into the white paper.

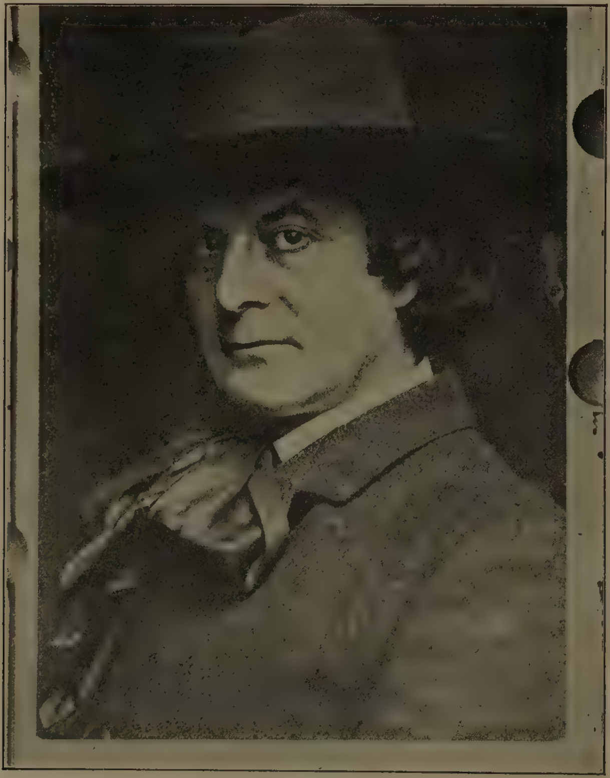


FIG. 41

Care must be exercised when using an air brush on a photograph not protected with a frisket to prevent a lighter color from encroaching on darker ones, which has the effect of producing a flat halftone. It is well as far as possible to confine the limits of the spray to the parts being treated.

The air-brush work having been completed, certain parts demand emphasizing; the hair requires a few delicate touches, and the tints in the face strengthened so that they contrast more strongly with the high lights. This is done by using ivory black diluted with water, which produces a transparent medium that is used to stipple the face and strengthen the modeling, so as to get sufficient contrast to overcome the flatness caused by the halftone screen when reproducing it. There are a few dark places that require lightening in color, which is done by stippling with opaque color, sufficient sap green being added so that the color will not appear blue and reproduce too

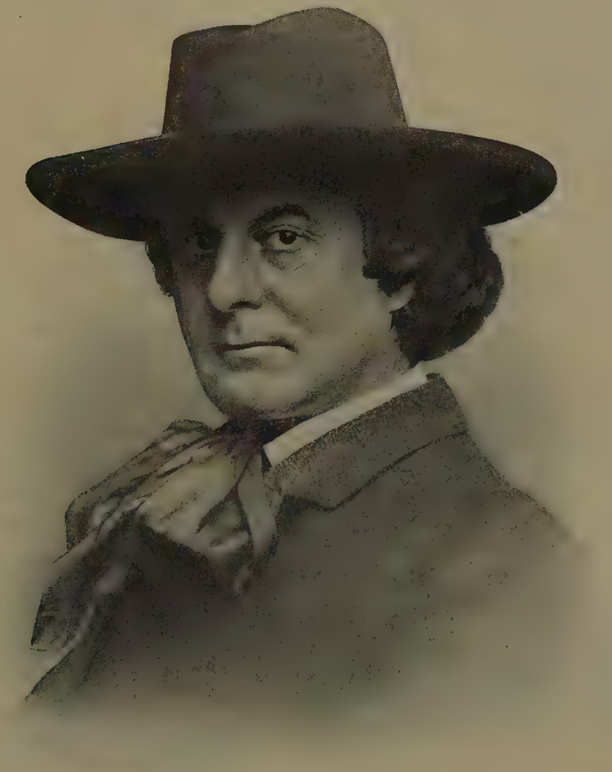


Fig. 42

light. This is a good way to treat portraits if they are small, as there is less danger of losing the character than if painted in the regular way.

31. The Completely Retouched Portrait.—In Fig. 42 is shown the photograph after all retouching on background and subject has been done, the photograph being ready for the halftone process.

TYPICAL EXAMPLES OF PORTRAIT RETOUCHING

32. Retouched Portrait With Square Finish and Outline.—The halftone shown in Fig. 43 is reproduced from a photograph and finished square with a fine line. The original photograph lacks contrast, so the eyes, eyebrows, nose, and mouth have to be strengthened and the hair treated with light and dark colors that should be rather strong, as the finished cut is to be printed on a poor quality of paper and a coarse-screen halftone has to be made. The halftone print shown in Fig. 43, however, has been made with a fine screen to show the effect of the retouched photograph.

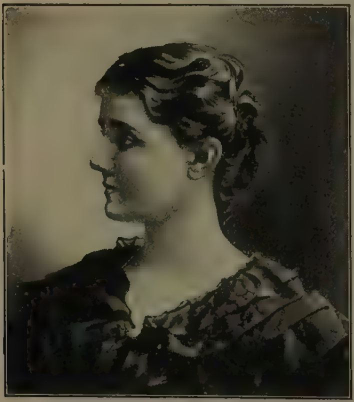


Fig. 43

When a coarse screen is used for a halftone, strong contrast is desirable in the original photograph; otherwise, the result will be a flat and gray reproduction. The fine line shown around the illustration is put on by the engraver with a lining machine. This line acts as a support for the rollers in printing and prevents tints from increasing in color along the outer edges.

33. Retouched Portrait With Square Finish and No Outline.—The same portrait is shown in Fig. 44, the line around it being omitted and is considered more artistic. In this case it serves fairly well without a line, but if the background were a light, delicate tint, it would be difficult to keep the edges around it uniform in value. An engraving with this finish should be printed on a good grade of paper.

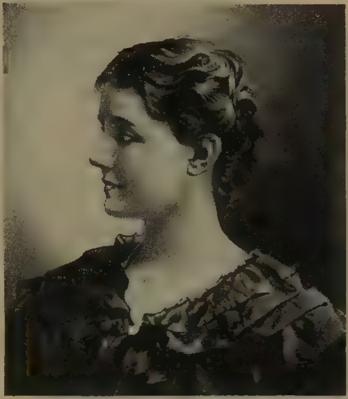


FIG. 44

34. Retouched Portrait With Elliptic Finish and Outline.—Sometimes it is desirable to use an elliptic shape for the halftone cut made from the retouched portrait, so as to avoid a square appearance. A mat with an elliptic opening of the correct proportion is laid on the photograph before it is sent to the photoengraver, who will finish the cut with or without a fine line, as desired.

Sometimes copy is sent to the engraver with just the height and width given, which is unsatisfactory, as the general appearance cannot be noted until after the engraving is made and the background may not look large enough or the head not appear well centered in the oval. To still further assist the printer, backgrounds are sometimes tooled by hand as shown in Fig. 45 or a tint put on the negative with a shading machine, which is cheaper and produces good results.

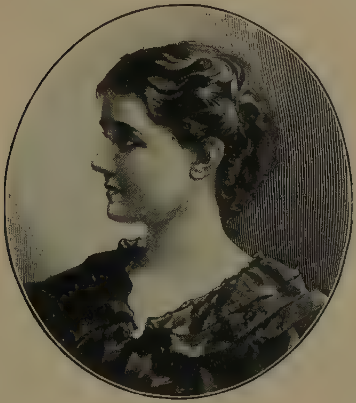


FIG. 45

35. Retouched Portrait With Silhouette Finish. The portrait previously reproduced in square and elliptic finishes is, in Fig. 46, treated in a complete silhouette style, and a line added around the edge of the subject, which, for advertising purposes, adds strength to the outline, particularly when the tints are light. The outline, if made heavy, distorts the true shape and when used on some portraits appears ridiculous.

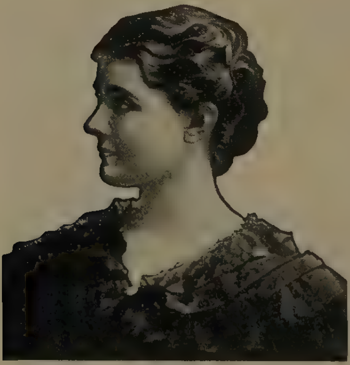


FIG. 46

When preparing this style of photograph for the engraver, the background may be removed by painting a white stripe around the photograph by hand. No air-brush work or frisket is necessary. All the artist does is to define an exact outline for the engraver to follow, who will tool a fine line around the edges of the work, and the larger parts of the tint will be removed with a routing machine.

36. Retouched Portrait Fully Vignetted.—The same portrait fully vignetted is shown in Fig. 47. A frisket was put on and cut out, so that only the background was exposed. It is difficult at times to keep the general shape of the vignette regular, and in this case a mat laid on the photograph which has an elliptic hole cut in it of the correct proportion but larger in size enables the artist to gauge the shape and regulate the extent of the graduating tints. The photograph was a reddish albumen print, so Indian red, lampblack and Talen's dark glossy red mixed with white in the proper proportions produced tints that matched the photograph, and when reproduced retained their correct values. Cuts vignetted in this manner must be printed upon a paper of high grade.

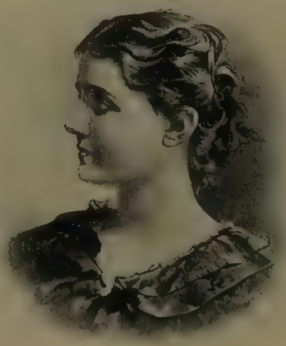


FIG. 47

37. Retouched Portrait Partly Vignetted.—In Fig. 48 is shown a reproduction from the same retouched photograph that has been already discussed, the halftone for which is partly vignetted and finished with a square base. Aside from these features, there is nothing in the way of treatment differing from that used for the previous reproductions of this same portrait.

38. Retouched Portrait in an Ornamental Setting. In addition to finishing halftones of retouched photographic portraits in the methods just described, a dignity is added by placing them in an ornamental or decorative setting, as shown in Fig. 49. The ornament may be simple in design, or it may be very elaborate.

39. Retouched Portrait From a Steel Engraving. The retouched portrait reproduced in Fig. 50 is taken from a steel-engraved print that is furnished. This portrait was to be one of a number in a book containing portraits of famous lawyers, and had to be treated in a style to match others in the same booklet. An enlargement is made from the steel-engraved print and the surface of the portrait painted over entirely by hand, no air-brush tints being used, as will be seen by referring to the reproduction. The entire surface is painted over to avoid a pattern or moire effect, which would have been produced by the dots of the halftone coming in contact with the lines of the steel engraving.

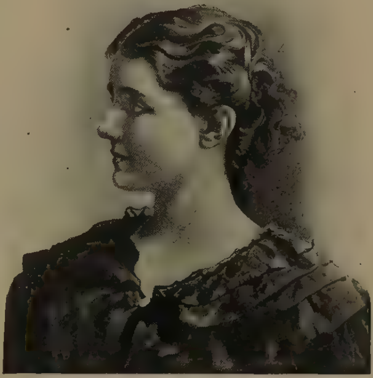


FIG. 48

This kind of work is difficult to do successfully unless the artist has a good idea of the anatomy of the face, so as to keep the character when modeling the delicate muscles, and at the same time avoid a hard, mechanical appearance. This portrait is to be printed in black over a buff-tint block, which is cut out where it comes underneath the lighter parts of the halftone, thus producing a better relief. The shirt bosom and collar are carefully tooled by the engraver, which produces a slightly different texture and helps the quality of the flesh tints. The halftone is finished without a line around the edges to avoid a hard, mechanical effect.

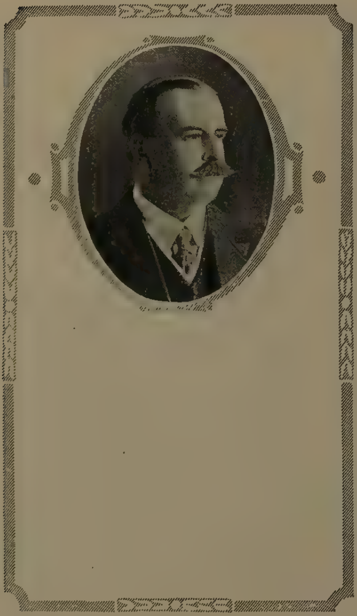


FIG. 49

40. Hand Retouching With a Brush.—Whenever it is required to do retouching on photographic portraits by hand, instead of with the air brush, flat brushes of various sizes are more convenient than round ones, as flat tints are more easily and quickly produced with them. When retouching a face, the paint should be put on thin, but should have sufficient covering power.

Modeling in opaque color can be done successfully by using the medium sparingly and touching the brush on another piece of paper before applying it to the photograph, so that any surplus color will be removed; this leaves the brush in a somewhat semidry state and a quick definite stroke produces a crisp tint and leaves no hard edge at the end of the stroke.

Retouchers have, as a rule, developed a style of their own for treating various subjects, and the methods given here may not meet with universal approval, but these styles were used successfully in producing the examples shown, and if the student can acquire sufficient ability to produce work of this class, various other styles may be acquired without difficulty.

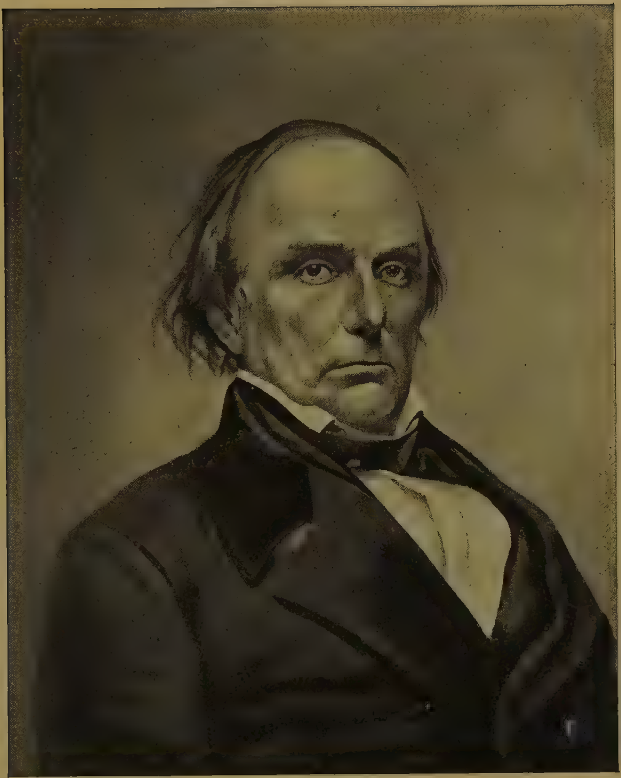


FIG. 50 286–I L T 149 § 22

RETOUCHING EXERCISES FOR HALFTONE ENGRAVING

GENERAL INFORMATION

41. Optional Arrangement of Work in Retouching. As in the case of the retouching exercises in the previous Section, the exercises here are optional, depending on the student's inclination and circumstances. However, if it is decided to execute the work as laid out, the student is expected to adhere to the same requirements of system, accuracy, and thoroughness in executing the work as applied to previous subjects.

42. Character of the Retouching Plates.—On account of the diversity of sizes of the photographs that are retouched, no specific sizes for plates can be given. If the student decides to do the retouching of the photographs he must make arrangements either to take the photographs himself (in which case special skill and the advice of a professional photographer are necessary), or he must have the photographs made for the purpose. He may be so situated that he can secure from among the odd or discarded prints of one of his photographer friends photographs of subjects suitable for retouching.

It will be necessary to secure two prints of each subject, for each plate is to be so arranged that Exercise A of the plate will comprise the unretouched photograph, and Exercise B of the same plate will comprise a retouched print of the same subject.

Both prints may be mounted by the corners on a 10″×15″ sheet of drawing paper, the paper being folded once to make it 10 in. × 7½ in., and then mailed flat. In this way each of the photographic prints may be 6 in. × 8 in., or even 7 in. × 9 in. in size.

PLATE 1

43. Exercise A, Plate 1.—Make or secure two photographic prints, about 6 in. × 8 in. or 7 in. × 9 in. (or smaller), of some simple cylindrical object such as a bottle, a tin can, etc., similar to, but not a copy of, the ink bottle in Fig. 17. Mount one print to serve as Exercise A and reserve the other for retouching.

44. Exercise B, Plate 1.—Mount and retouch the second photographic print of the bottle, can, etc., according to the method of working as described in the text accompanying Figs. 17 and 18, using also methods previously taught.

45. Final Work on Plate 1.—Write or letter on the back of the sheet, or on the back of each photographic print, the title, Plate 1: Retouching for Halftones, Part 2, name, class letters and number, address, etc. Mail the plate flat to the Schools for examination as previously advised, and proceed with Plate 2.

PLATE 2

46. Exercise A, Plate 2.—Make or secure two photographic prints, about 6 in. × 8 in. or 7 in. × 9 in. (or smaller), of some heavy casting of a part of a large machine, or some detail of machinery; similar to, but not a copy, of the casting in Figs. 12, 13, and 14. Mount one print to serve as Exercise A and reserve the other for retouching.

47. Exercise B, Plate 2.—Mount and retouch the second photographic print of the casting or machine detail, according to the method of working as described in the text accompanying Fig. 12, using methods previously taught

48. Final Work on Plate 2.—Write or letter on the back of the sheet, or on the back of each photographic print, the title, Plate 2: Retouching for Halftones, Part 2, name, class letters and number, address, etc. Mail the plate flat to the Schools for examination, and proceed with Plate 3.

PLATE 3

49. Exercise A, Plate 3.—Make or secure two photographic prints, about 6 in. × 8 in., or 7 in. × 9 in. (or smaller), of some manufactured object or article composed of various materials, similar to, but not a copy of, the camera shown in Fig. 8. Mount one print to serve as Exercise A and reserve the other for retouching.

50. Exercise B, Plate 3.—Mount and retouch the second photographic print of the manufactured article (such as a camera, etc.), according to the method of working as described in the text accompanying Figs. 8 and 9, using every method as previously taught that will result in a successfully retouched print.

51. Final Work on Plate 3.—Write or letter on the back of the sheet, or on the back of each photographic print, the title, Plate 3: Retouching for Halftones, Part 2; name, class letters and number, address, etc. Mail the plate flat to the Schools for examination, and proceed with Plate 4.

PLATE 4

52. Exercise A, Plate 4.—Make or secure two photographic prints, about 6 in. × 8 in., or 7 in. × 9 in. (or smaller), of an interior scene or view. This may be a view similar to, but not a copy of, the show window of Fig. 25, or a photograph of a room or store interior. Mount one print to serve as Exercise A and reserve the other for retouching.

53. Exercise B, Plate 4.—Mount and retouch the second photographic print of the interior scene or view, according to the method of working as described in the text accompanying Figs. 25 and 26, and using all methods, skill, and experience so far practiced.

54. Final Work on Plate 4.—Write or letter on the back of the sheet, or on the back of each photographic print, the title, Plate 4: Retouching for Halftones, Part 2, name, class letters and number, address, etc. Mail the plate flat to the Schools for examination, and proceed with Plate 5.

PLATE 5

55. Exercise A, Plate 5.—Make or secure two photographic prints, about 6 in. × 8 in., or 7 in. × 9 in. (or smaller), of a portrait of a man, woman, or child. If nothing else can be made or secured, an ordinary cabinet-sized photograph will do. The photograph cannot be properly retouched if it is too small. Mount one print to serve as Exercise A and reserve the other for retouching.

56. Exercise B, Plate 5.—Mount and retouch the second photographic print of the portrait, according to the methods of working as described in the text accompanying Figs. 41 to 50, inclusive, and putting into use all the skill and knowledge of methods so far acquired.

57. Final Work on Plate 5.—Write or letter on the back of the sheet, or on the back of each photographic print, the title, Plate 5: Retouching for Halftones, Part 2, name, class letters and number, address, etc. Mail the plate flat to the Schools for examination, and proceed with Plate 6.

PLATE 6

58. Exercise A, Plate 6.—Make or secure two photographic prints, about 6 in. × 8 in., or 7 in. × 9 in. (or smaller), of a piece of mechanical apparatus or a machine of which it is desired to show one part most prominently, the rest being kept subordinate. Mount one print to serve as Exercise A and reserve the other for retouching.

59. Exercise B, Plate 6.—Mount and retouch the second photographic print so as to gray or dim all parts of it except the feature that is to be brought out prominently, according to the methods of working as described in the text accompanying Figs. 33 and 34, and putting into use all the skill and knowledge of methods so far acquired.

60. Final Work on Plate 6.—Write or letter on the back of the sheet, or on the back of each photographic print, the title, Plate 6: Retouching for Halftones, Part 2, name, class letters and number, address, etc., and mail the plate to the Schools in the usual way for examination.

If any redrawn or rerendered work on any of the plates of this Section has been called for and has not yet been completed, it should be satisfactorily finished at this time. After all the required work on the plates of this Section has been completed the work of the next Section should be taken up at once.

DRAWING FOR COLOR REPRODUCTION

INTRODUCTION

PURPOSE

1. Commercial Illustrations in Color.—The training so far given in drawing for the reproductive processes has been confined to the line and halftone processes, both of which, since the plates resulting from them can be printed only in black or some other single tone, may be termed *monotone processes*. This training, however, has shown that illustrators, in painting their originals to be reproduced as advertisement pictures, cover designs, newspaper illustrations, cartoons, or magazine and book illustrations, frequently work in water colors, oil colors, and pastels. The methods of reproducing in their true colors such originals rendered in color differ materially from the line process and the ordinary black-and-white halftone process; therefore, since these differences in processes impose upon the artist certain requirements and restrictions, it is necessary that he should possess some knowledge of the color processes of reproduction and the proper methods of drawing and painting for these processes.

To aid the student in such work, it is the intention in this Section to give information that will thoroughly cover the points mentioned. From the standpoint of technical trade practices, however, this treatise is by no means exhaustive; in fact, no attempt is made to give other information about color processes

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than that which will be of advantage to the illustrator to know in order that his drawings or paintings in colors may be such as to reproduce well.

2. Method of Conducting the Training.—In this training in drawing and painting for color-process work, there is first of all discussed the methods of making various kinds of metal printing plates from original paintings in color, from retouched and colored photographs, and from objects, articles, or fabrics. Then there is taken up the making of drawings and paintings for color-process work for advertisement pictures, cover designs, newspaper illustrations, cartoons, and magazine and book illustrations.

PROCESSES OF COLOR REPRODUCTION

CLASSIFICATION OF PROCESSES

3. Relief, Intaglio, and Planographic Processes. The history of the many attempts at color printing during past years is an interesting one, and those who desire to pursue the subject from a historical standpoint can find much information on the subject in public libraries and elsewhere. The student of the history of color printing will learn that scores of methods of printing in colored inks were used in the past, and discussions of these methods will show him how it was necessary for artists and printers to experiment for years and decades to devise ways in which colored originals could be reproduced in printed form. However interesting such historical data may be, it is only with the color processes in actual use today that the artist is concerned, and then only with those which are most widely used.

4. Speaking broadly, the most suitable classification of modern color printing processes is into the *relief*, the *intaglio*, and the *planographic*, which names are derived from the nature of the printing surfaces of the wood, stone, and metal plates employed.

The general processes known as **relief** include line engraving, halftone engraving, three- and four-color halftone engraving—

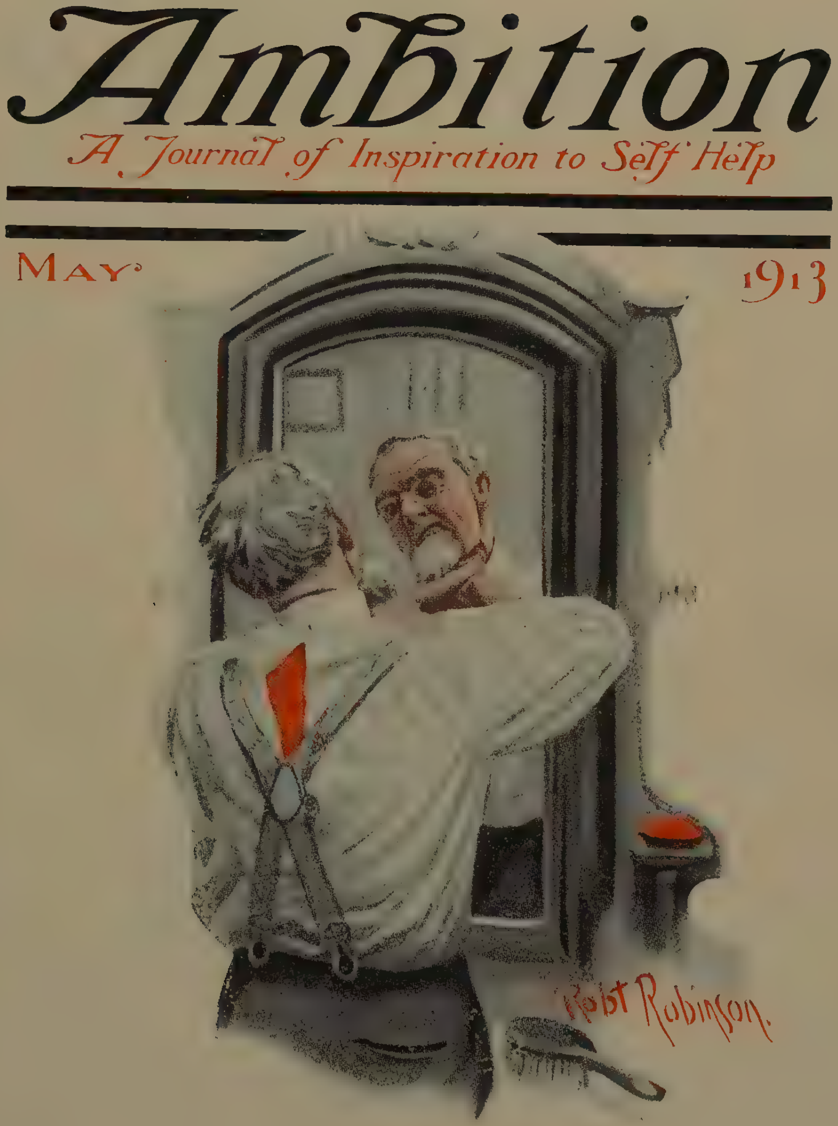
Ambition
A Journal of Inspiration to Self Help
May
1913
Robt Robinson.

Fig. 1

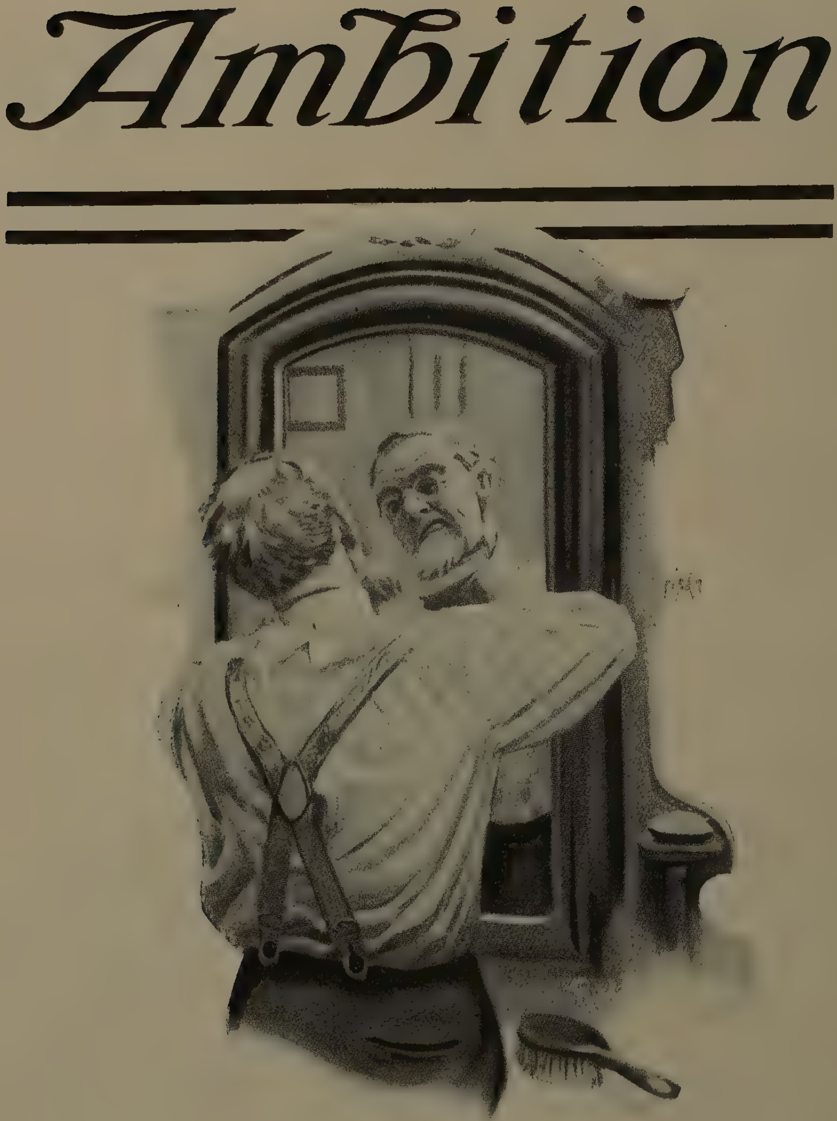

FIG. 2

A Journal of Inspiration to Self Help

MAY 1913

Robt Robinson.

FIG. 3

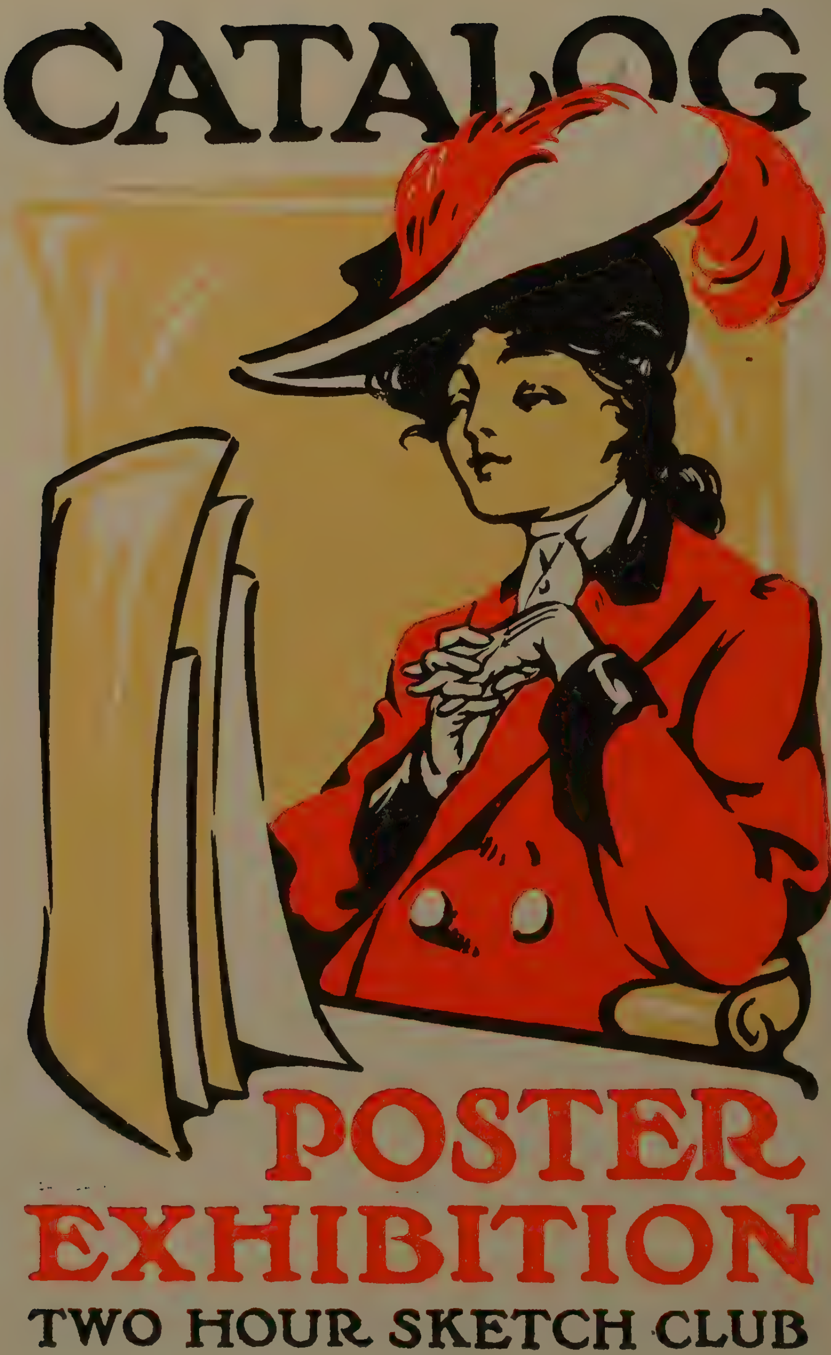

Fig. 4

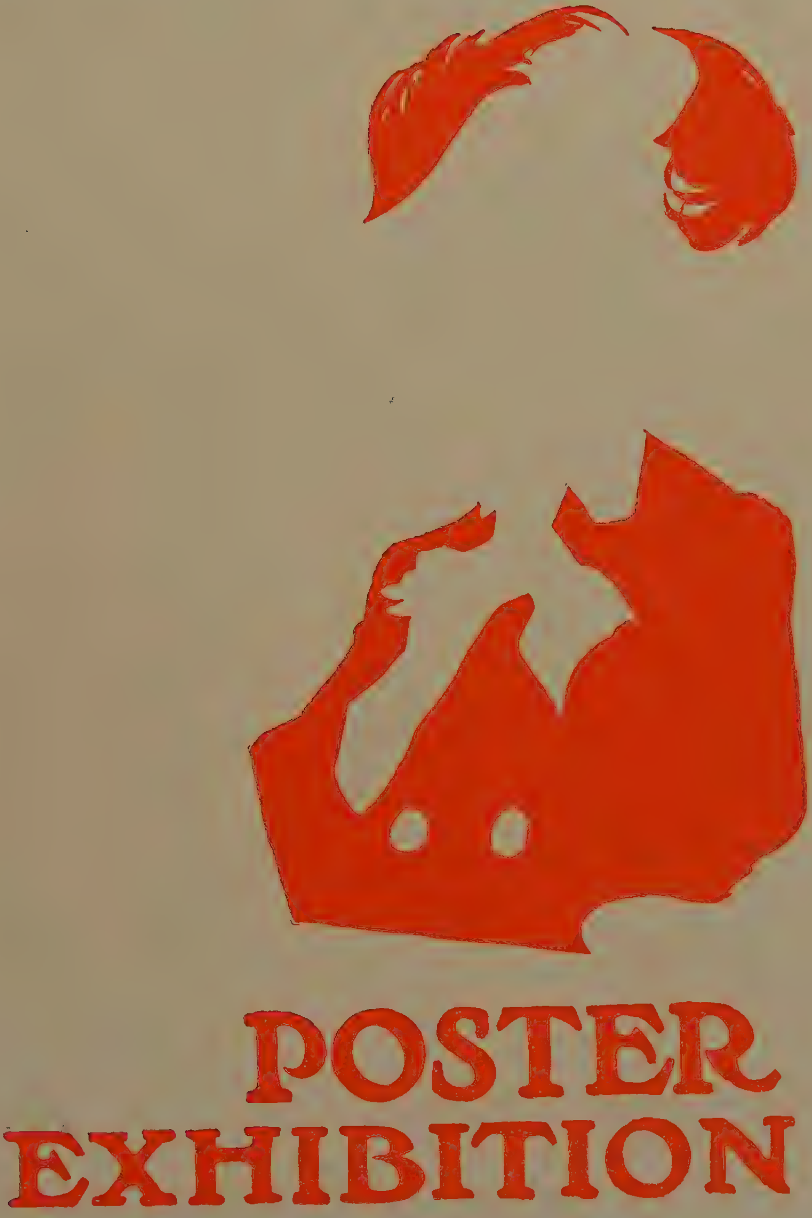

FIG. 5

FIG. 6

§ 23 286

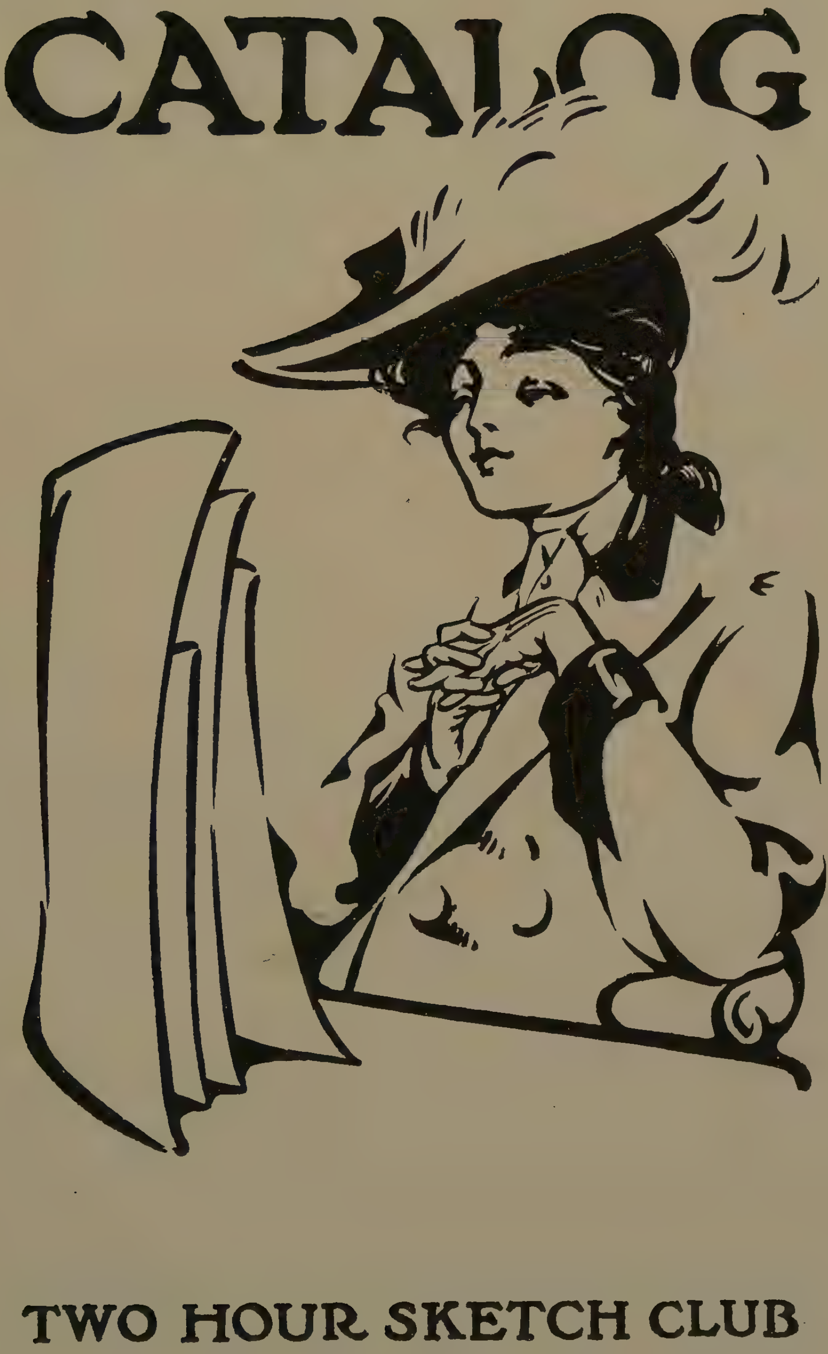

FIG. 7

in fact, all processes in which the printing surface of the plate is raised in relief, so that it may be inked, and impressed upon paper, just as type is inked and printed from.

Those processes included under the head of **intaglio** include all incised line or stipple engraving on copper or steel plates, etchings, mezzotints, aquatints, photogravures, etc. The characteristic of this class of processes is that all lines or dots are cut into and below the surface of the metal plate, the ink being rubbed into the grooves, or depressions, and then the plate impressed upon the paper.

The third class of these processes, known as **planographic,** includes chiefly lithography, and refers to the characteristic of the process whereby the printing surface is comparatively flat; that is, it is neither in relief nor in intaglio. It is true that lithography is not strictly planographic, because the ink on the printing surface of lithograph plates stands up somewhat in relief, but the printing plate itself is neither in relief nor incised, as is shown when this process is discussed.

5. In discussing these various classes of color-process work, they are treated under the names of the more commonly known processes; as, *line* and *halftone color processes*, for the relief processes; *photogravure color processes*, for the intaglio processes; and *lithograph color processes*, for the planographic processes.

LINE AND HALFTONE COLOR PROCESSES

ONE-COLOR ILLUSTRATIONS

6. In treating the subjects of drawing for line engraving and for halftone engraving in previous Sections, the discussion is confined entirely to printing in black or in monotone, for no line-engraved plate or halftone-engraved plate can be made to print more than one color at a time. True it is that different values, shades, and tints of the one ink used can be produced with a single line plate or a single halftone plate, but no single plate made by one of these processes can at one impression be made to print in all the colors of nature.

It is to be understood, of course, that a line engraving does not have to be printed in black ink on white paper; it may be printed in any one color of ink on paper of any color. In this respect, a line engraving may serve to print a design or a picture in color, but in only one color; and it would not come under the classification of color-process work.

7. Similarly, in the case of halftone engraving, a single halftone plate can be printed in black or in one color, depending on the ink used. There is also an added advantage in using a halftone plate; namely, that not only a solid color can be produced, but also lighter values and tints *of that same color*. Nevertheless, the use of such a single halftone plate, when printing a single color, does not bring it under the head of what is termed color-process work, even if the printed result is in a color.

TWO-COLOR ILLUSTRATIONS

8. Two Line-Engraved Plates for Color Printing. It is possible to get two-color effects by using line-engraved plates, but the colors will be what are known as *flat colors*, and for each color that is printed there must be a separate plate. The term *flat color*, however, does not necessarily mean that every part of each line-engraved plate will print the colored ink full strength and solid. By using the gray method previously described, by placing stippling, white shade-lines, shading-film work, etc. on the original drawing, or on the metal plate, or by hand-tooling the plate, graded effects and variations may be produced even on a line-engraved plate. When such varied effects are produced on each one of the plates, and a careful selection of colored inks and a judicious combining of plates is carried out, very naturalistic effects can be secured by printing two line-engraved plates in color.

By printing one color over the other, as a light yellow over a light blue, an effective green can be produced. Ordinarily, however, in two-color work from two line-engraved plates, the most refined effects are secured by keeping each color distinct. This process must not be confused with two-color work printed from halftone-engraved plates, which process is entirely different, as is pointed out later.

Specimens of two-color work from line-engraved plates are not shown here, for the reason that specimens of color work from line-engraved plates are shown later in connection with the discussion of three- and four-color work.

9. Two Halftone-Engraved Plates for Color Printing. In producing illustrations in two colors by means of two halftone plates it is possible to show graded hues and values, and by printing one on top of the other there can be secured certain softly modulated values, shades, and hues that would be impossible in printing with two line-engraved plates.

The effects that can be secured by printing from two halftone plates are best illustrated by means of specimens of such printing, one of which is shown in Fig. 1. The completed picture or cover design, as shown in Fig. 1, is printed in black and orange inks. Fig. 2 shows the impression made from the halftone plate intended for black ink. It contains the greater portion of the picture; the mirror frame, the old man's trousers, the mirror back, etc. appear in dark values of black, while the reflections in the mirror, the folds of the white shirt, the old man's hair and beard, etc. are shown by light values of the black ink. Fig. 3 shows the impression made from the halftone plate intended for orange ink, the old man's shirt, the pincushion top, and the artist's signature being in strong orange, while light values of orange combined with light values of black portray the flesh tones. The method of making the plates for such color work is by proper color-selecting filters and special halftone screens, which method is the same as used for making plates for the three- and four-color halftone processes and will be fully described in connection with the discussion of those processes.

THREE- AND FOUR-COLOR ILLUSTRATIONS

10. Three or More Line-Engraved Plates for Color Printing.—As already shown, interesting effects in color printing can be secured with two line-engraved plates, each plate printing a separate color; even more interesting effects can be secured by printing three, four, or more line-engraved plates in as many colors.

In general, the remarks that apply to printing with two line-engraved plates apply also to printing with three or more such plates. The specimen of such work reproduced in Fig. 4, in the form of a cover design, serves to show the excellent effect that can be secured if the artist prepares his original with careful consideration as to how it is to be reproduced. As will be observed on referring to Fig. 4, the finished cover is printed in three colors—red, salmon, and black.

For printing this cover there must be three line-engraved plates—one for the red ink, as shown in Fig. 5; one for the salmon-colored ink, as shown in Fig. 6; and one for the black ink, as shown in Fig. 7. The artist needs to prepare only one drawing, as will be discussed later, from which the engraver makes three separate photographic negatives, from which, in turn, are made the three line-engraved plates.

11. Three or Four Halftone-Engraved Plates for Color Printing.—When it is desired to reproduce a water-color, an oil, or a pastel painting, or a colored object, article, or fabric in all the colors of nature, a very different process from any so far discussed must be employed. Not only can line engravings no longer be used, their place being taken by half-tone engravings, but still other changes must be made in photographing the original, in making the plates, and in printing therefrom. Three or four plates made from three or four specially prepared negatives are required, there being printed from each plate a separate one of the four colors—red, yellow, blue, and black—to produce the design or picture in the colors of nature. The details of producing these plates and printing from them in successive impressions, one upon the other, follow.

12. Photographing the Drawing or Painting.—The drawing or painting from which the color plates are to be made is mounted on the vertical copying board of the photoengraving camera, just as in photographing the drawing for a line engraving or a halftone engraving. The general arrangement of the main parts of the camera, with its plates, halftone screen, etc., is the same as in making negatives for ordinary halftones; but, inasmuch as three or four photographs of the same subject are required for the three or four halftone plates, these photographs must be made through special *filters*, as well as through the regular halftone screens, in order to bring out the proper color selections for each plate.

13. Special Halftone Screens Used for Color Work. As has been learned, the screens used for ordinary monotone halftone work are square, being ruled anywhere from fifty to two hundred lines to the inch. The screens for three- and four-color halftone work are of similar ruling, but they are circular; also, each screen is placed in an aluminum frame that is marked off in degrees, so that it can be shifted or turned to any desired angle just as an oculist in testing a patient's eyes uses circular disks or lenses and shifts or turns them in a frame to get the desired angle or axis.

When making the exposure for the plate that is to be used in printing black—that is, the *key plate*—the circular halftone screen is set so that its lines run at 45° with the horizontal. When making the exposure for the plate that is to be used for printing red, the screen is turned 30° farther around than it was for the black plate; that is, 75° from the horizontal. When making the exposure for the plate that is to be used for printing blue, the screen is turned 60° farther around than it was for the black plate; that is, 105° from the horizontal on one side and 75° from the horizontal on the other side. For the photograph that is to be used for the plate that is to print yellow the screen is arranged so that one set of its lines runs horizontally and the other set perpendicularly; that is, at an angle of 90° with the horizontal.

14. Special Light Filters Used for Color Work.—The exposures for the three or four plates for color printing are made not only through special halftone screens, as just mentioned, but also through colored filters, which consist of double glass plates between which is a thin film of colored liquid.

When making the photograph for the key plate; that is, the plate that is to be used in printing black, no special filter is needed. In photographing for the plate that is to be used for printing red, the filter is green (blue + yellow), which is the complementary color of red. Only the red rays of light can pass through this green filter and thus reach the negative; light rays from all other hues in the original are absorbed by the green filter. When making the exposure for the plate that is to be used for printing blue, the filter is orange (red + yellow), which is the complementary color of blue. Only the blue rays can pass through this orange filter and thus reach the negative, all other colored light rays being absorbed by the orange filter. In photographing for the plate that is to be used for printing yellow, the filter is violet (red + blue), which is the complementary color of yellow. Only the yellow rays can pass through this violet filter and thus reach the negative, all other colored light rays being absorbed by the violet filter.

The result of this fourfold process of photographing the original drawing or painting is a set of four separate wet negatives.

15. Developing the Negative.—The wet negatives are next developed and intensified, as previously described for line and halftone engraving. The negatives must be dried and coated with collodion and turned, provided they are not already reversed by the prism attachment previously referred to.

16. Preparing, Etching, and Finishing the Copper Plates.—The process of preparing the copper plates, as well as the processes of etching, reetching, burnishing, etc., is then passed through with great care, as is fully described in connection with the halftone process.

From the intricate character of the plates, and the fact that the finished color print will consist of four impressions one on top of the other, it is evident that the original plates must be etched with extraordinary care by the engravers. The etch must not be too deep; and the reetching required can be done only by skilled engravers who are artists as well. After preliminary proofs of the three- or four-color work are struck off in printer's ink, the engraver carefully examines them to see

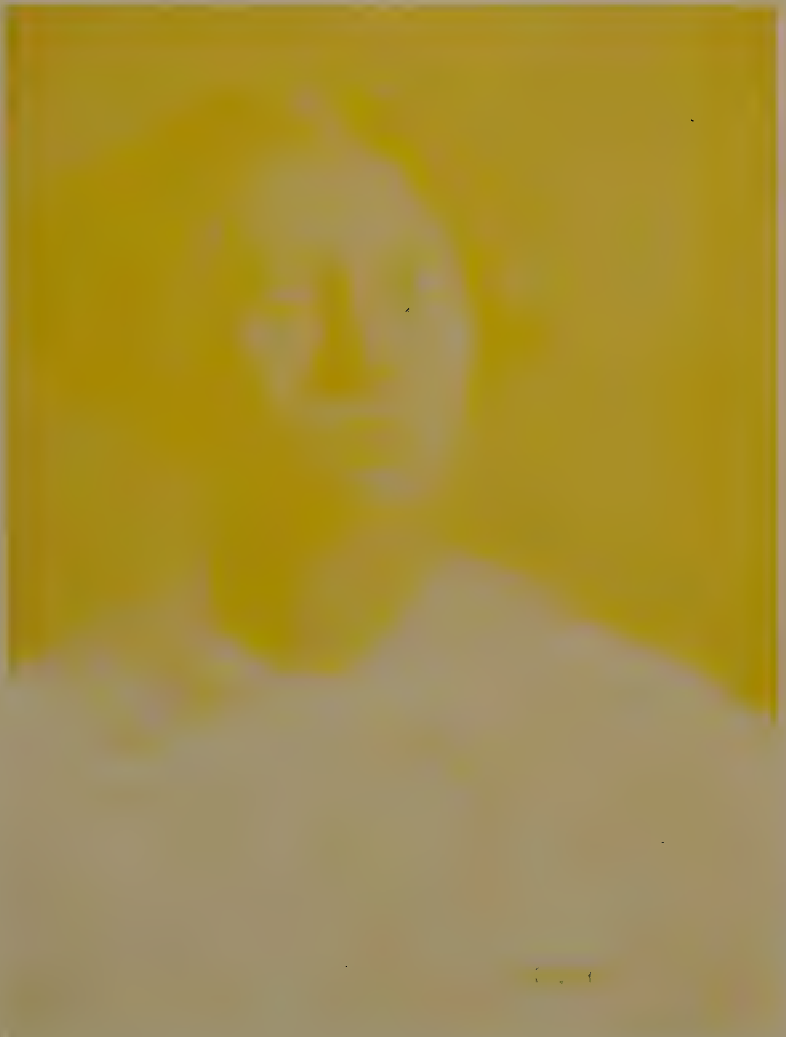

FIG. 8

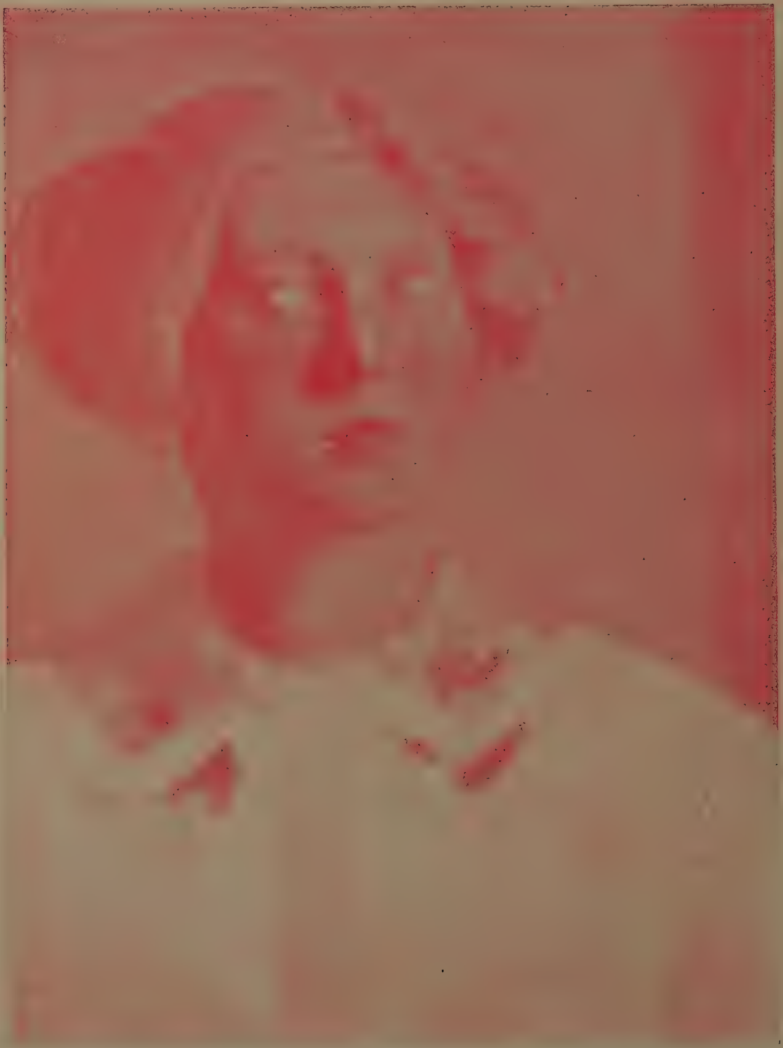

FIG. 9

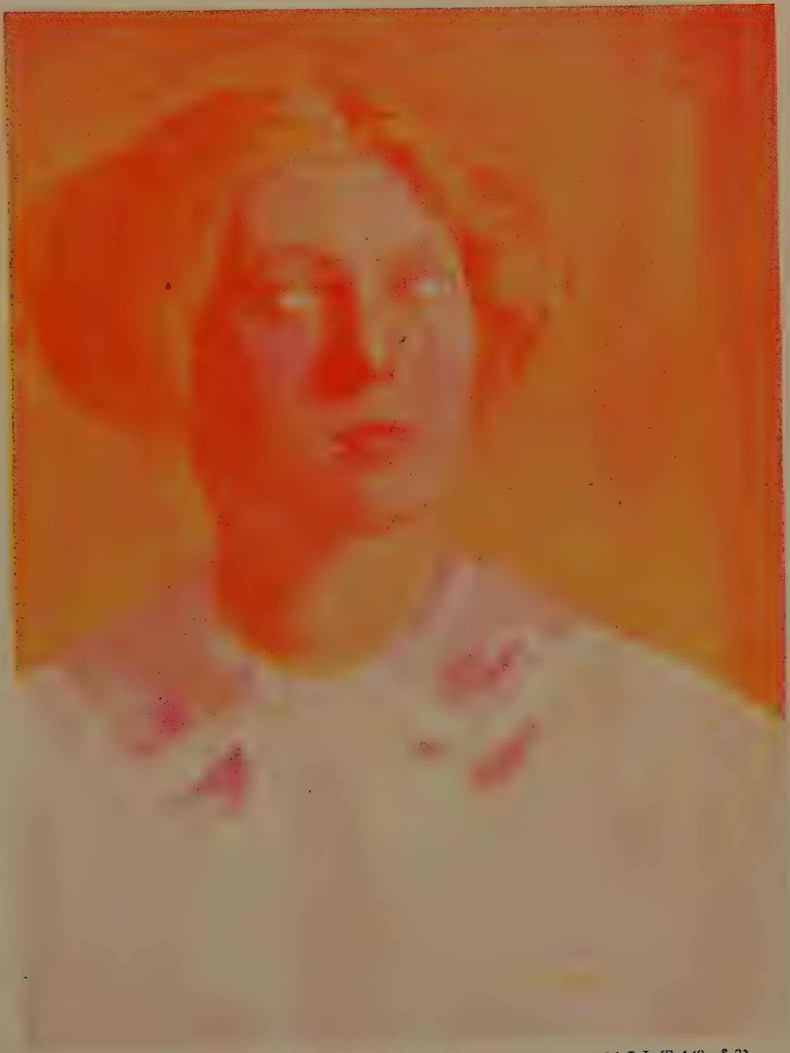

FIG. 10

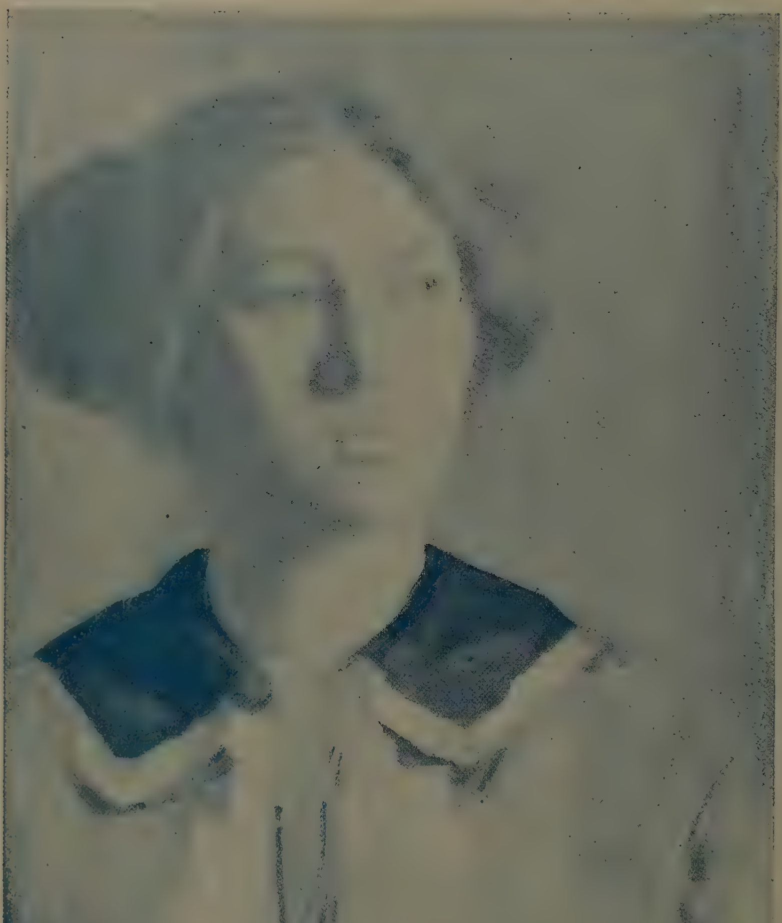

Fig. 11

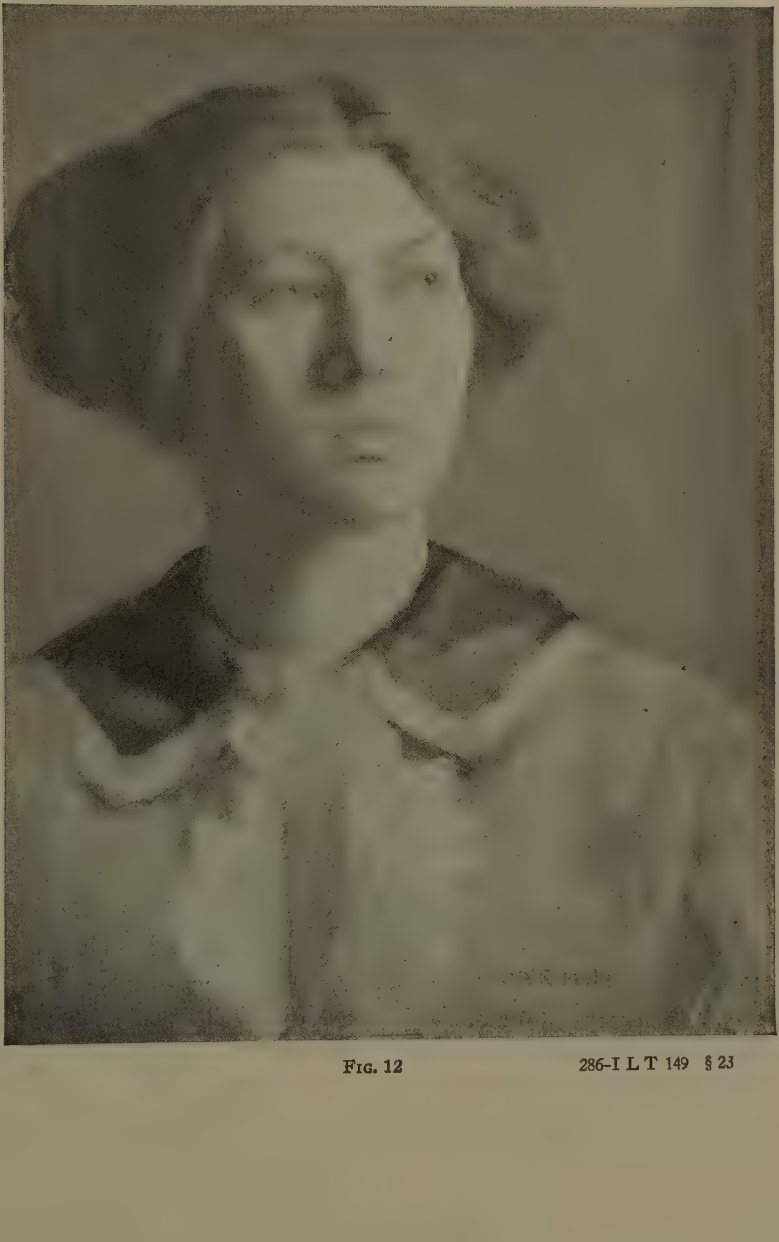

FIG. 12

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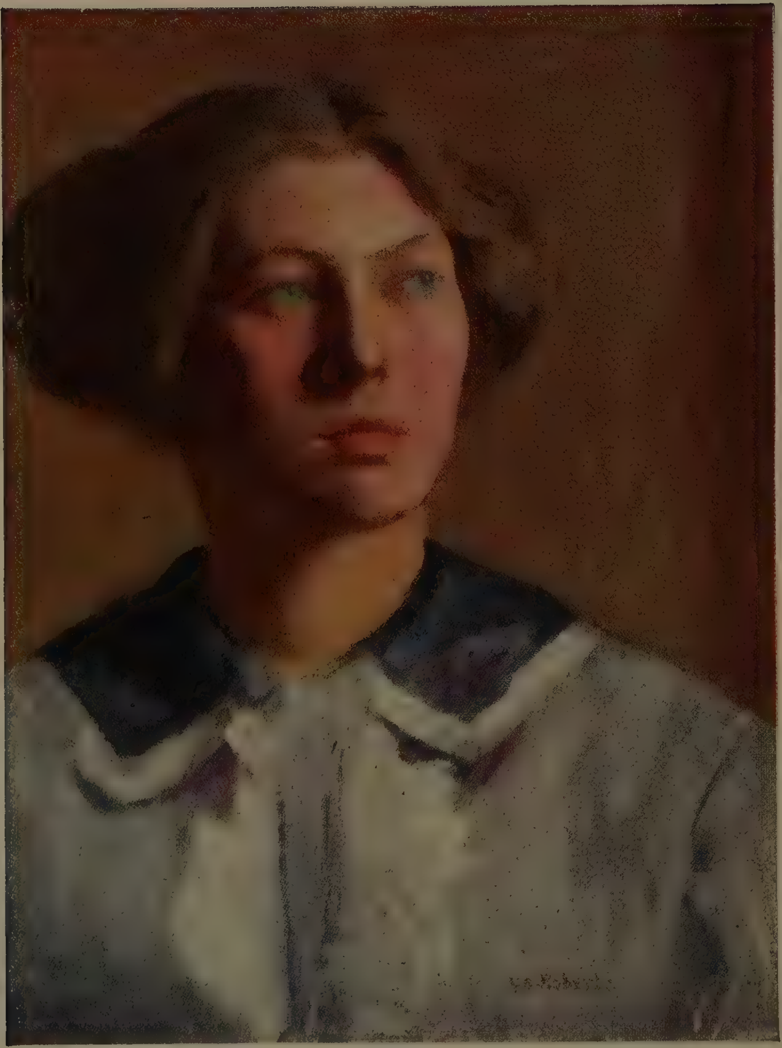

Fig. 13 286–I L T 149 § 23

whether the resulting color print faithfully reproduces all the hues, values, and intensities of the original. For instance, a piece of drapery that, in the original painting, was a rich red-purple, may come out too blue in the engraver's first proof. In such a case, the engraver must reetch, or perhaps hand-tool, the portion of the plate that is to print blue. Perhaps a certain tone value is too dark, or perhaps a certain high light needs to be brought out more sharply. All this will require additional reetching or tooling. After enough inspection and tooling on the plates to secure a four-color proof that faithfully reproduces the natural colors of the original, the plates are ready for the color-printing process.

17. Printing From Three- or Four-Color Plates. Three- or four-color halftone plates are printed from in exactly the same manner as ordinary black-and-white halftone plates except that three or four separate impressions, as the case may be, are required. To illustrate one order in which the plates are printed from, a specimen of such multicolor printing is here shown.

Figs. 8, 9, 10, 11, 12, and 13 show separate individual impressions and combinations from a set of plates for quadricolor printing. Fig. 8 shows an impression from the yellow plate, the first to be printed; Fig. 9, an impression from the red plate, the second to be printed; Fig. 10, impressions from the yellow and the red plates, combined; Fig. 11, an impression from the blue plate, the third to be printed; Fig. 12, the black plate; and Fig. 13 the combined impressions of the yellow, the red, the blue, and the black plates, in other words, the finished picture in its natural colors. This order of printing the colors is not arbitrary, and may be altered in individual cases.

When only the three plates, yellow, red, and blue, are used, the process is known as the **three-color process**; when the black plate is employed and combined with the other three plates, the process is known as the **four-color**, or **quadricolor, process.**

18. The successful printing of three- and four-color plates is almost an art in itself. The work of the artist, the photographer, and the plate maker must be supplemented by careful and skilful work on the part of an artist printer. As received by the printer from the photoengraver, the plates are thin copper slabs covered with finely etched engraving, which seems like a mere mist on the highly polished surface of the metal. These copper plates must then be fastened to, or mounted on, a block to make them the proper height for printing. The most approved way of doing this is to secure them by means of adjustable catches, or hooks, to a solid-metal base, as by this method each plate can be adjusted to the proper position, so that the colors may be superimposed exactly over each other. The *make-ready*, as the process of making the plates ready to print is termed by the printer, must be most thorough for each color, in order that none of the artistic qualities of the plate may be lost; in addition, the work of the printer must be mechanically correct, so that the plate, with its delicate tracery, will give a large number of impressions without showing signs of wear. The amount and the color of the ink must be very carefully regulated, also, as a variation in the supply will make a difference in the finished product. Care must be taken with the paper before and during the printing process, in order to prevent it from stretching or shrinking, as either of these actions is detrimental to good work.

Last, and most important of all, the printer must possess printing presses that *register;* that is, the press must be so accurately made and adjusted that, when a sheet of paper is to be printed on a number of times, the lines and dots of an illustration will strike exactly in the same place on the sheet each time the paper is run through the press. Errors in photographing and engraving can, in a measure, be corrected; but should the press fail to register, all the skill of the photographer and engraver is lost.

VARIATIONS OF THE LINE AND HALFTONE COLOR PROCESSES

19. Combination Line and Halftone Plates.—The method of combining line-engraved plates and halftone-engraved plates so as to print a black or a monotone illustration at one impression has already been discussed. The same process of combining the two classes of printing surfaces can be carried out when color work is to be printed.

In making such combination cuts, the engraver usually photographs the line drawing and the painting for the halftone portion separately and then combines the two films to make a combination cut. The film for the halftone may be stripped from its glass negative and placed in its proper place on the negative for the line cut, and the printing plate then made. It is possible, also, to *mortise* the line cut—that is, saw out a space from the block—and to insert the halftone in this space. Again, the line-engraved plate and the halftone-engraved plate may be made separately and the halftone *sweated on* the same base with an electrotype—that is, a metal copy, or replica, as previously explained—of the line cut. However, the first method mentioned is usually followed by the engraver when making such a combination cut.

It should be remembered, though, that even if such a combination is effected, the plate can be made to print only one color at a time. If it is desired to surround some halftones of pictures in one color with line cuts of ornamental work in another color, two plates will be needed—one halftone plate and one line plate, each designed to print a separate color.

20. First Method of Three-Color Printing.—The first method of three-color printing consisted in making three negatives on dry plates through filters of various colors, as previously described; then these three negatives were copied so as to produce three positives, which, in turn, were photographed through a halftone screen to produce negatives. This method was of course slow, involving nine operations, and always at the risk of having some inaccuracy occur.

21. Three-Color Plates Made Without Color Filters. A process designed to do away entirely with color filters when photographing the original colored painting was devised by Dr. E. Albert, of Munich. It is an emulsion process, the plates being subjected to dyes of such a composition and being so placed on the plates as to allow the halftone negatives to produce directly the required plates for color printing. In certain respects, however, this process was not practical, for, to cut out strong violet lights, it was necessary to make use of at least one filter, a yellow one.

Great advance has also been made in recent years by the manufacturers of plates that are sensitive to the proper colors, it being possible to procure dry plates that are sensitized in such a way that three- or four-color halftone printing plates can be made directly from them.

22. Three- and Four-Color Prints Run Continuously.—As is well known, illustrations in three and four colors are not printed on the same presses as those used for printing from type and for black-and-white illustrations; also, in the case of three- and four-color printing, a special paper is required and each print is made slowly and carefully.

Attempts are being made, however, to do multicolor printing by the three- and four-color halftone processes continuously, just as is other rapid presswork. Of the various special machines for doing such work, one of the most successful is a printing press of the flat-bed type. This machine has four impression cylinders, four sets of inking rollers, four ink slabs, and four beds for the printing blocks. The continuous printing of the four-color illustrations is effected as follows: The paper is fed in at one end, carried from one cylinder to another until all the separate impressions have been made, and then forced out at the other end, the illustration in color being completely printed at the end of the operation.

The rather crude color printing used on the color sheets of Sunday newspapers is done on rapid rotary presses. The plates, however, are not the regular three-color halftones, but are hand-worked; that is, the shading machine is employed to get tints and values and considerable hand tooling is done. Furthermore, the register is seldom absolutely accurate, but this is not a serious defect in this class of work.

Perhaps the highest grade of rapid four-color work in which halftones are run on a rotary press is done on the covers of certain of the well-known monthly magazines. At every revolution of the press a complete four-color print is made.

23. Hand-Colored Plates for Color Printing.—Certain kinds of color printing, especially in commercial work, are done from plates made without the aid of photography. One method of making such plates consists in drawing directly on a zinc plate what is termed the *key plate*, and then making from this plate as many transfers as there are to be colors in the finished print, which transfers are then also put onto zinc plates. If a light tint is desired, the colors are put in on these color zinc plates at the proper places by means of the shading-film machine; and if a heavy tint is to be printed, the color is painted in solid.

This class of work is used for certain illustrations in the color sections of Sunday-newspaper supplements.

24. The Metzograph Screen in Color Work.—The use of the metzograph screen for black-and-white halftones has already been discussed. This screen is also used for certain kinds of color printing. The process consists in placing this metzograph screen in front of the sensitized plate in the camera, thus taking the place of the ruled halftone screen. The thought is that the metzograph screen gives a result that is softer and more artistic than the screen ruled in squares.

The color work done with the aid of the metzograph screen thus resembles lithography, although the dots and markings are somewhat coarser than those of a lithograph.

There is considerable difference of opinion as to which gives the most artistic result, the metzograph screen or the fine halftone screen, because it must be decided on the basis of personal opinion and individual taste. However, it is generally admitted that the metzograph screen is softer and more desirable for pictorial and landscape studies, whereas the ruled screen is more suitable for mechanical subjects, commercial articles, etc.

25. Other Multicolor Printing Processes.—It is not necessary that the illustrator should be made acquainted with more than the main halftone color processes, such as have been given, yet it may be well to mention that there have been tried and are being used a great variety of other color printing processes. Among them is the *offset method*, in which the halftone processes are applied in a lithographic way by first making the impression on a rubber-covered cylinder and then making the offset onto paper. Another is the *collotype method*, with which prints are made direct from glass-mounted gelatine films that are more or less hardened by relative degrees of action of light rays. However, in a treatise of this kind, it is not possible to present with sufficient fulness of detail the intricacies of these various processes from a trade or a technical standpoint; in fact, there is no occasion to do so, for, as has been stated, the young illustrator needs to know the main processes only so far as they influence his method of preparing his drawing or painting.

PHOTOGRAVURE COLOR PROCESS

26. Characteristic of the Photogravure Process. The chief characteristic of the photogravure color process is that it belongs to the class of intaglio processes; namely, the processes in which the printing surface of the copper plate is incised, so that the engraving consists of cut-in lines and dots instead of raised lines and dots, as in the line and halftone processes.

The impression on the metal plate may be secured by using the positive of a photographic glass negative, or by the gelatine-film process, as previously described for the collotype method.

An impression on the sensitized metal plate from a photographic glass-plate negative will, of course, result in a relief plate, the lines and dots forming the picture being raised, as in the case of line and halftone engravings. But, if from the same photographic negative a positive is made, and this positive is then employed to act upon the sensitized metal plate, the result will be that the lines and dots of the picture will be etched into the surface of the copper plate in intaglio. The ink for printing is afterwards rubbed into these grooves and depressions, and the plate is then printed from.

If the gelatine-film method is used, the same principle of relative degrees of hardening of the gelatine occurs, as described for the collotype method. But, in this case, the gelatine film is not used direct as a printing surface; rather, it is used as the means of transferring the positive image to the surface of the metal plate, and serves as a resist for the etching acid, as previously explained in connection with line and halftone plates.

Since, by this intaglio etching, the densest colors come where the intaglio etching on the copper plate is the deepest, the photogravure process forms an ideal process for color printing, because such is the method by which the artist himself works when painting, especially when working in oils; namely, piling up the paint most thickly where the colors are densest.

The copper plate is furnished with a grained surface by means of a resin dust properly applied.

27. Rembrandt Photogravure Color Process.—In the case of the Rembrandt process of color printing, only the general principles can be given, for, owing to the carefully guarded secret process of working, no exact details are available. The process partakes of the nature of photogravure, but a ruled screen instead of resin dust, for a grained surface, is put upon the plate. This screen not only serves as an ink-holding surface, but allows the surface to be inked and the ink then wiped off the level surface before printing—one of the requirements of the photogravure process.

In the Rembrandt process, the etching is done on a copper roller. This roller is inked by another roller, and a steel scraping knife then scrapes the ink free from the surface of the etched roller, which is then ready for printing. The paper is fed into the rotary press, as in the case of other rotary printing, and comes out with the finished photogravure in colors printed on it complete.

LITHOGRAPH COLOR PROCESS

28. Characteristics of the Lithographic Process. As previously indicated, lithography differs from both the halftone color work and the photogravure color work in that it is strictly neither a relief process nor an intaglio process, but a planographic process; that is, the printing surface is neither raised in relief nor incised.

The simple principle of lithography is as follows: Upon a flat polished calcareous stone; that is, a stone composed of or containing limestone or calcium carbonate, the design, or picture, is drawn with greasy crayon. Limestone has a great affinity for water, but any oily or greasy substance, as the greasy crayon lines in the picture, repels water. If, therefore, the surface of the stone is dampened by passing over it a damp roller, the surface of the stone where there are no crayon lines will absorb the water, but the greasy crayon lines will not. If an inked roller is next passed over the stone the damp portions of the stone, where there are no lines or dots of the picture, will repel the ink on the roller and not take it up, but the greasy crayon lines or dots will take up the ink, which will adhere to these lines and dots, just as printer's ink ordinarily adheres to the printing surface of type. The print may then be made from the stone onto a sheet of paper, just as any print is made.

29. Lithographic Printing in Colors.—One of the first methods of color printing by lithography consisted in printing the picture or design in monotone—black, brown, etc.—on a light-colored background, and then scraping out the lights from this background. In this way an effect of, say, three colors could be produced by two printings.

In real multicolor work by lithography, what is known as *chromolithography*, the effect is secured by making consecutive impressions, one on top of another, from the lithographic stones or plates. Each color in the lithograph requires a separate stone, just as each color in three- or four-color halftone printing requires a separate plate.

In another form of lithographic color printing, the stones or plates are made to print in solid tones, lines, and stipple, just as zinc etchings print, the colors being allowed to blend and combine on the paper, thus securing multicolor effects.

At one time an attempt was made to apply to lithography the principle of securing full-color effects by the use of only the three primary colors, red, yellow, and blue, as in the quadricolor halftone process. It was found, however, that lithographic inks do not possess sufficient transparency to make such printing successful. The plan of using a separate stone or plate for each color gives the best results.

30. Use of Zinc and Aluminum Plates in Lithography.—Zinc and aluminum plates are now used extensively in place of stone for lithographic printing. While the method of printing is different, the general principle of reproducing the picture or the design is the same.

It is claimed by some authorities that just as meritorious work can be produced from zinc and aluminum surfaces as from lithographic stones, but other equally well-informed lithographers deny this, and continue to use stone for their best work. It is probably a matter of personal ability. One man might do his best work on metal, and another his best work on stone. Metal, however, is much cheaper than lithographic stone and very much lighter, and as it is used in a thin sheet it is more easily and quickly handled. Where the most artistic tints and textures are desired, stone, on account of its mineral properties, is said to give the best results.

31. Process of Printing Lithographs.—The press ordinarily used in lithographic printing from stones resembles a flat-bed printing press, the only important difference being that provision is made for moistening the stone as well as for inking it. The moistening is done by means of damp rollers, which precede the inking rollers. This style of lithographic press, however, is gradually being supplanted by rotary presses that use aluminum plates and have all the requisites for the highest grades of lithographic printing. For certain classes of work, the light aluminum plate and the fast-moving rotary press are improvements over the heavy stone and the slow-moving flat-bed press. The pliability of the aluminum plate and the ease with which it can be adjusted to a printing cylinder have resulted in the introduction and use of rotary lithographic presses that print two or three colors at one time. This method gives results that are equal to those obtained by a single-color press, and, from an economic standpoint, is a great step in advance, as it permits lithographers to compete with the three- and four-color printing processes now in general use.

32. Example of Commercial Lithography.—The colored illustration shown accompanying this page is a typical specimen of commercial lithography used as an advertisement illustration. A careful inspection of this print through a magnifying glass will reveal the characteristics of a lithograph as distinguished from a color print made by any photoengraving process, such as a three- or four-color halftone, for instance. In the first place, there is no evidence of a halftone screen, the background and all other details being grained. The blendings are soft, yet they show evidences of planes and strokes, the smoothest blending being in the portrayal of the face.

DESIGNING AND DRAWING COMMERCIAL ILLUSTRATIONS IN COLOR

MATERIALS AND METHODS OF WORK

33. Materials Required.—The mediums required by the commercial artist to prepare his originals for reproduction by the various color processes are those with which the student has already become familiar through his work in the rendering Sections; namely, crayon, water colors, oil colors, and pastels. The various materials and methods of work in these mediums are by this time also well known. However, the use of these materials and mediums heretofore has been purely from the standpoint of technique, and little has been said concerning the special methods to be employed in using these well-known materials to prepare colored originals that are to be reproduced by some one of the commercial color processes. A few general directions along this line are therefore given to the young commercial artist, so that whenever he is called on to do color work he will know how to prepare his drawings or paintings.

34. Scope of Training in Color-Process Work.—It is to be clearly understood that the purpose here is not to give an exhaustive treatise on all the artistic and technical requirements for each specialized line of commercial art work in color.

It would be impossible so to treat the subjects; and, further, such minute treatment is not necessary. Artists who work for the quadricolor process or for reproduction by lithography are specialists in those lines, and have arrived at their advanced skilful work only after long years of study, experiment, and experience. Furthermore, each color-process engraving plant, as well as each lithographic establishment, has trade secrets of work, and in many cases has a system of apprenticeship whereby the artists connected with the establishment learn the artistic and technical requirements only by such apprenticeship experience. In addition, there are many lines of color-process work for which the artist who believes in "art for art's sake" makes his own plates and experiments in printing therefrom. These, however, need not concern the commercial artist.

It is the intention here to explain to the young commercial artist only those things about drawing and designing for color reproduction which he must know in order to prepare suitable originals in colors for advertisers, newspaper, book and magazine publishers, and other users of colored illustrations. The individual requirements, office practices, tricks of the trade, etc. peculiar to certain studios, art departments, drafting rooms, photoengravers, and advertising agencies, cannot be compiled, classified, and presented to the student in printed form, but must be learned through experience by each individual commercial artist as he works for or in such establishments.

METHODS OF PREPARING ORIGINALS IN COLOR

ADVERTISEMENT ILLUSTRATIONS

35. Relative Value of Knowledge of Color Processes. However important the subject of color-process reproduction may be to the engraver, the lithographer, and the printer, the young commercial artist must guard against overestimating the importance of an exhaustive knowledge of color-process work. The most important equipment for the commercial artist is a thorough training in drawing and painting, to which, if he is to draw illustrations for advertisements, must be added good business sense. Advertisers are continually looking for good ideas in pictorial form; with well-drawn and attractively rendered *originals*, as such pictures are termed, as a foundation, the modern color engraver can do wonders, working up from them halftone color plates so tooled, reetched, and otherwise manipulated as to be attractive from the standpoint of advertising and salesmanship. A good pictorial aid to a selling idea, well drawn and rendered, even though it may not be in every respect suitable for color-process reproduction, will be far more valuable to an advertiser than a poor idea drawn in a weak, indifferent style, even if it exhibits on the artist's part a thorough knowledge of engraving methods and is absolutely workmanlike and practical from the engraver's viewpoint.

But it must be borne in mind that the illustrator possessing a knowledge of the reproductive process has an advantage over the illustrator who does not have such knowledge, for he can prepare his original drawings and paintings in such a way as to get the best effects most economically in the reproductions. If he starts his commercial-art career by becoming an employe of a photoengraving establishment or an advertising agency, such a knowledge of process reproduction, coupled with artistic ability, will make his services valuable indeed.

36. Influence of Conditions Under Which Artist Works.—The degree to which the illustrator must conform to the requirements of color-process reproduction must also be taken into account. Young artists who connect themselves with art departments in which commercial work is done must, of course, conform to the requirements of such work, for by so doing they will save money for their firm and thereby make their services more valuable. However, when the young illustrator works as a free lance, he has considerably more latitude, although he, too, can always be sure of more satisfactory work in the reproduction if he draws and paints with the requirements of color process well in mind.

37. Types of Advertisement Illustrations in Color. As has been shown, *advertisement illustrations*—that is, pictorial work done commercially for the person or the firm that is employing pictures for the purpose of making their advertisements so convincing that they will sell the goods—are of many kinds. Most numerous, perhaps, are the advertisement illustrations in newspapers and magazines. Because of the comparatively low cost, the majority of these are done in line, and many others in black-and-white halftone. However, certain large advertisers use illustrations in colors either on the center pages of magazines or on the rear page; that is, the back of the cover. The number of colors used in these advertisements depends on the number employed in printing the front cover design.

Such magazines as the Saturday Evening Post use a cover design printed in two colors, orange and black; and, of course, any colored advertisement pictures used therein must be limited to these same two colors. Certain other magazines, of which the Ladies' Home Journal, the Woman's Home Companion, and other magazines of that class, are representative, use multicolor cover designs printed by the three- or the four-color process. Their advertisements in color, usually confined to the back cover page, are also in three or four colors, and are therefore correspondingly expensive for the advertiser. Some such advertisements run into thousands of dollars per issue. In another type of magazine, for instance the "smart" type of theatrical or fashion periodical, or even certain fiction magazines, use is made of cover designs, and, of course, advertisement pictures, printed by the lithographic or chromolithographic processes.

It is not a difficult matter to distinguish the color process used in any particular case. The two-color process may be recognized by the orange and black inks, or any other two colors; the three- and four-color processes, by the evidences of the superimposed halftone screens, each at a different angle, which may be easily seen through a magnifying glass, or, if the register is not absolutely accurate, by the little lines of red, yellow, blue, and black along the edges of the picture; and the colored photogravure and the lithographic processes, by the absence of the mechanically ruled screen and by the fine-grained surface. These methods of identification, however, are only general; more exact characteristics must be observed in order to identify absolutely the particular reproductive process employed.

38. One-Color Advertisement Illustrations.—The young illustrator has already been made familiar with the various kinds of advertisement pictures in line and in black-and-white halftone, as well as with the manner in which original drawings or paintings must be prepared. When preparing advertisement pictures to be reproduced in color, there is very little additional that need be known from the standpoint of advertising and selling points, but a number of new requirements arise that must be met to suit the conditions of reproduction in multicolor.

One of the simplest forms of advertisement illustration in color consists of a picture in line, mass, or stipple and printed in one flat color from a single line-engraved plate. The original drawing for such a colored illustration is prepared in black ink on white cardboard, the print then being made from a line-engraved plate in any color and upon stock of any color that the publisher, advertiser, or printer may prefer. The artist may, or may not, depending on circumstances, send with his large-scale original drawing a color sketch to show just how the finished one-color print is to appear.

Another simple form of advertisement illustration in color is that of an ordinary halftone printed in one color; as, for instance, a landscape printed entirely in green, although such a form of one-color halftone is not common. The original for such a picture would probably be a photograph, or it could be a crayon or a wash drawing, or even a painting in colors, from which the engraver would then make a single halftone plate, from which, later, a print in the desired single color would be made.

39. Two-Color Advertisement Illustrations.—The next type of advertisement picture, in degree of intricacy, is the two-color illustration. Such an illustration may consist of two line-engraved plates combined, a line-engraved plate and a halftone-engraved plate combined, or two halftone-engraved plates combined, a different color being printed from each plate in the case of each set.

In the case of an illustration made from two line-engraved plates combined, the original may be in the form of a single black-and-white drawing, the engraver then making his two line-engraved plates by taking two photographs from the same black-and-white drawing. Let it be assumed that a two-color picture of the United States flag is to be printed in red and blue on white paper. In such a case, the artist would first draw the flag in detail in pencil on white cardboard or paper, and then he would ink in solid, with black ink, the portions that are to be printed in blue, for instance. The portions that are to be printed in red, the stripes or bars of the flag, he would not ink in solid, but, by means of little guide lines or outlines in ink, he would indicate the positions and extent of the red stripes or bars. The first photograph made by the engraver from this single black-and-white drawing would result in a negative, from which would be made the line-engraved plate from which the blue of the flag is to be printed. Before making this line-engraved plate, however, the engraver wipes off from the glass negative those portions indicating the parts that are to make the plate from which the red is to be printed; then he makes the metal plate for the blue. Next, he makes a second photograph from the original black-and-white drawing, resulting in a negative from which is to be made the line-engraved plate from which is to be printed the red parts of the flag. However, before making this line-engraved plate, he wipes off from the glass negative those portions indicating the parts that are to be used in making the plate from which the blue is to be printed. When making the plate for the red, he paints in solid, with the acid-resisting varnish, on the metal plate the portions indicating stripes, or bars, of the flag, using the outlines as guide lines. This process will be referred to again; but the chief thing for the artist to know is that, for two-color printing from line-engraved plates, he need make only one black-and-white drawing. A small color sketch is of assistance to the engraver.

40. For a two-color advertisement illustration consisting of a line-engraved plate and a halftone-engraved plate combined, the artist, as in the preceding case, needs to make only one drawing. In Fig. 14 is reproduced an advertisement picture of this class, the three-quarter figure of the man being printed in brown, and the ornament and lettering at top and at lower right-hand corner in green. The original drawing for this illustration was made two or three times the size of this reproduction, the man's figure being rendered in black crayon over wash, and the ornamental devices and lettering being drawn in black ink. The engraver then made two photographs from the original drawing, resulting in two negatives, one, in the usual line-engraving method, to be used for the line plate, and the other, in the halftone-engraving method, through a screen, for the halftone plate. The two engraved plates were then made in the usual manner, the halftone-engraved plate being used to print the man's figure in brown and the line-engraved plate to print the ornament and lettering in green.

41. The most usual type of two-color advertisement pictures is that in which two-halftone plates, each being used to print in a separate color, are employed to make a combination print. The process by which such plates are made has already been described, and is illustrated in Figs. 1, 2, and 3.

The original drawings for such two-color blended halftones are usually made on an enlarged scale, in opaque water colors (gouache) on illustrators' board, or in oil colors on academy board. The colors used are usually exactly like the colors that are to appear in the reproduction. A common color combination is a warm brownish-black and an orange-red, although orange and green, brown and green, and other combinations have been tried successfully. If the combination is black and orange, then, at such places where only black, either solid or in graduated tones, is to show in the illustration, only black pigment need be used, and at places where only orange, either solid or graduated, is to show, only orange pigment is required. However, where hues other than pure black or pure orange are to show, the two pigments may be freely mixed and blended to

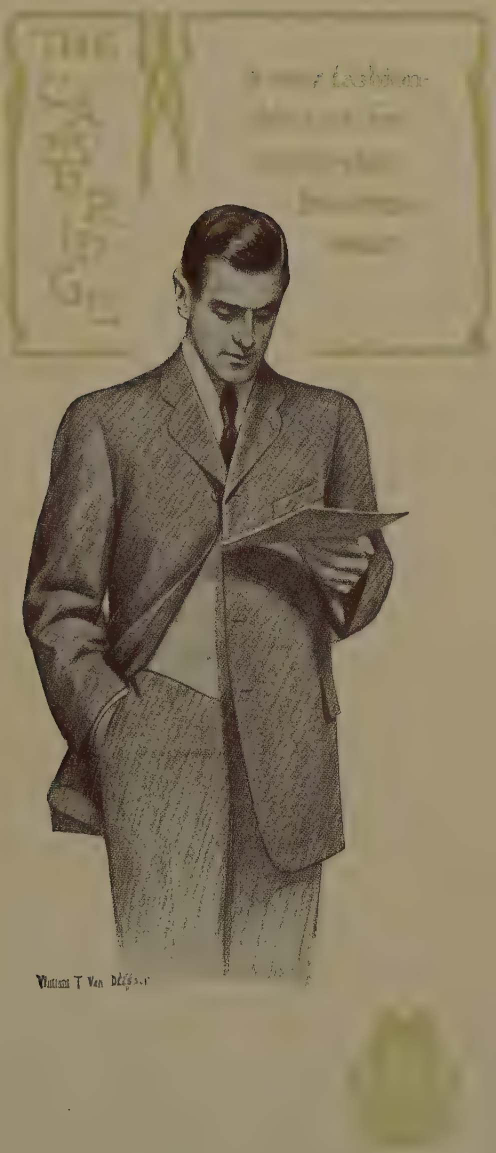

Fig. 14

get the effects, the camera of the photoengraver being relied on to make the proper color selections for the two halftone plates.

It is surprising to know what naturalistic color effects can be secured in the original painting and in the reproduction by using only orange and black. With a thin film of orange and a thin film of black, each properly graduated, the most naturalistic flesh values can be portrayed. From these light flesh values, these two-color values can be deepened, until, by combining full-strength orange and full-strength black, a rich, deep brown can be secured. Similarly, the effects of flags, colored costumes and uniforms, variegated flower gardens, etc. can all be portrayed by orange and black, for a light value of black will readily pass for blue, and a light value of orange for pink, etc.

42. Sometimes photoengravers accept advertisement illustrations for reproduction in the two-color halftone process from commercial artists who do not pretend to be familiar with process reproduction methods, their originals being painted in full color; that is, in as many colors as they care to use. In such cases, the photoengraver, by the use of proper color filters, can make color selections that will enable him to get the proper effects with orange and black inks. However, it is best for the artist to be familiar with the requirements of the two-color halftone process, and to paint his original in orange pigment and black pigment as just described.

43. Three- and Four-Color Advertisement Illustrations.—The originals for advertisements to be printed in three or four colors may be painted in water colors, oils, or pastels, and in full color, as many hues being used as may suit the fancy of the artist. Care, however, must be taken that the illustration contains well-preserved values, so that some of the graying effect of the halftone screen may be compensated for.

The advertisement artist, who receives a commission to paint a picture in colors to be reproduced by the three-color or the quadricolor process, is usually well known and experienced in color work. Under such conditions, and because the modern engraver is well skilled in the manipulation of three- and four-color plates, the advertisement illustrator working for such types of color reproduction has the greatest freedom and latitude in painting his originals. His main object should be to paint a rich and attractive illustration, bending all his efforts toward producing a beautiful picture that will have strong selling value for the advertiser and his product. The engraver will attend to bringing out features of the picture that need emphasis from the advertiser's standpoint.

44. Colored Lithographic Advertisement Illustrations.—The advertisement illustrations reproduced by lithographic processes are, of course, not usually reproduced as magazine advertisements or advertisement pictures for periodicals. However, street-car advertising cards, calendars, labels, coverings of cartons and containers, and similar publicity illustrations are made in the form of lithographic printing.

Commercial conditions are such that most of the originals for lithographic printing are done by artists employed regularly on the lithographer's staff, and who, therefore, have every opportunity to become familiar with methods of lithographic printing, or by artists who at one time were lithographic workers, and who therefore know the artistic and technical requirements of the process. Even such artists first make the original drawing or painting in colors and then turn it over to lithographic draftsmen who make the copy or transfer upon the stones or plates. The lithographic artists working on the firm's art staff usually make their originals in oils, water colors, pastels, colored crayons, etc., and of the same size as the proposed reproduction. However, there are no strict technicalities that make it impossible for the outside artist unacquainted with the details of the lithographic process to draw or paint his original in full color and have it reproduced successfully by lithography. He need simply bend all his efforts to securing a good pictorial advertising idea, and then draw and render it attractively.

An example of a typical lithographed advertisement picture is shown in Fig. 15. The reproduction here is made by manipulated three-color halftone plates, but the original was a large lithograph used for bill-board advertising.

COVER DESIGNS

45. Types of Cover Designs in Color.—Reference has already been made to the various classes of cover designs in colors, as well as to their classification from the standpoint of color reproduction—the one-color, the two-color, the three- and four-color, line and halftone cuts, the photogravured, and the lithographed cover designs.

The young artist's duty is to make himself familiar with these various kinds of colored covers by the continual inspection of publications in which they are used. A scrapbook of covers, with proper data, including its method of printing, placed underneath each one, will be helpful in this direction.

46. The designing of covers for catalogs, circulars, magazines, and books, some of them in colors, has already been treated in a Section devoted to that purpose. Therefore, as far as designing and rendering covers are concerned, ample training has been given. The remaining requirement for the designer is that he must be very careful to prepare the original drawing or painting for his cover design in such a way that it will be suitable for reproduction by the particular color process wanted or used by the advertiser or the publisher for whom the cover design is intended. For example, it would be very much out of place for a designer to prepare an elaborate painting in full color, with the expectation that it would be reproduced in four colors, for an advertiser or a publisher whose business policy does not warrant such work or whose custom is to use only two-halftone color work. Likewise, if a certain advertiser or publisher is accustomed to using covers in full color, printed either by the quadricolor process or by the lithographic process, it would be very much out of place to submit a one- or a two-color sketch in flat colors.

The data that must be known by the commercial artist when making drawings for the various color processes has already been fully discussed in connection with advertisement illustrations in color, and, in a general way, the same methods of procedure apply to the drawing or the painting of cover designs in color.

47. One-Color Cover Designs.—Cover designs, as has already been learned, are frequently printed in one color on a colored stock, especially in catalog work. In Fig. 16 are shown specimens of catalog- and booklet-cover designs in color, the red cover and the green one in the lower left-hand corner being examples of one-color designs printed on another color or shade of stock. In the case of each one of these covers, the ornament and the lettering on the original drawings were done in black ink on white cardboard. A line-engraved plate was then made in each case and the design was printed in the desired color of ink upon the color of stock selected.

48. Cover Designs of Two or More Colors.—Cover designs printed in two or more flat colors from line-engraved plates are always strong and effective. Such a process could produce the cover shown at the lower right-hand corner of Fig. 16, but, for convenience, it is here printed by the quadricolor process.

An excellent example of a cover design in two flat colors and black, from line-engraved plates, as well as the method of printing it, is shown in Figs. 4, 5, 6, and 7. Fig. 4 illustrates the complete cover and Figs. 5, 6, and 7 show impressions made from the three line-engraved plates—red, salmon, and black—used to produce the cover design; however, in a case like this, aside from his little colored sketch to show the publisher, advertiser, or printer how the cover is to appear in colors, the artist needs to prepare for the engraver only one large drawing, in black ink on white cardboard. The portion of the drawing that is to be used by the engraver for making the key plate—the plate to print black—is filled in solid. In the cases of the other portions of the drawing, however, which are to produce the red plate and the salmon plate, the field or extent to be occupied by any color is simply suggested by outline guide lines that serve to define, on the metal plates, the fields, or limits, of the color for each plate. This is then filled in solid on the plate by the engraver. The original drawing for the cover reproduced in Fig. 4 would therefore appear very much as shown in Fig. 7, except that it would be considerably larger,

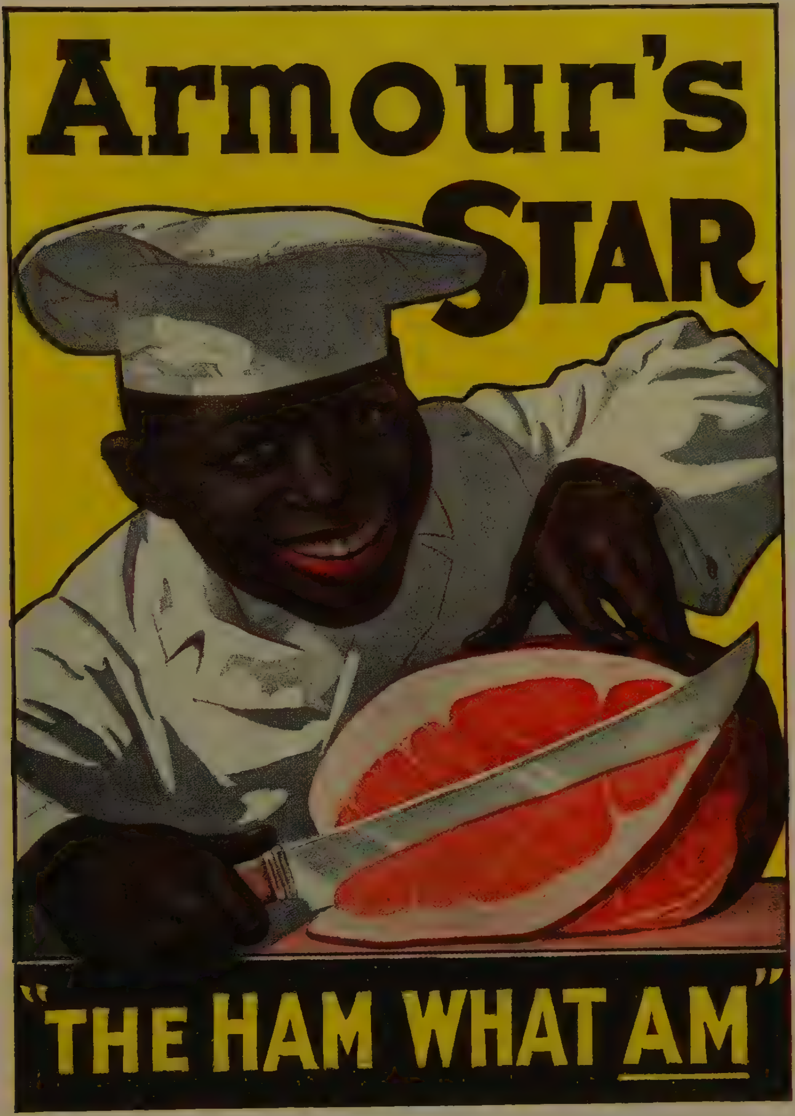

Fig. 15

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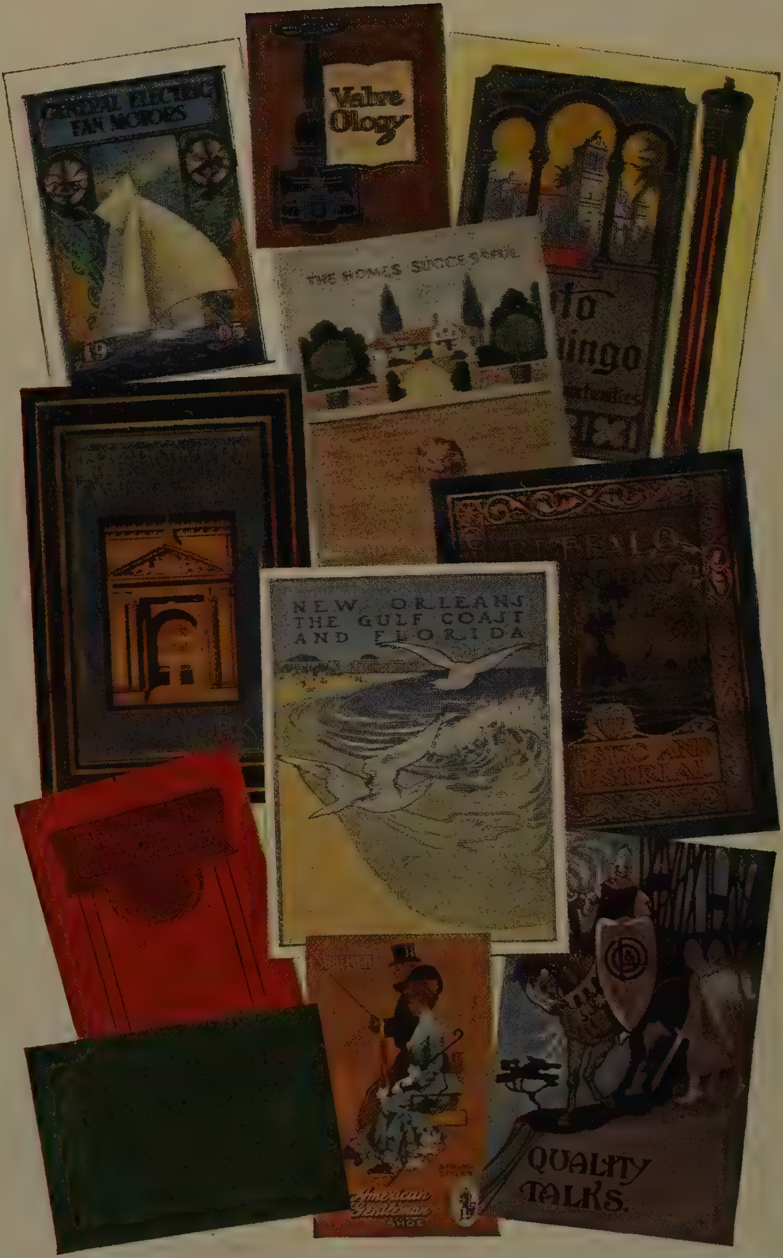
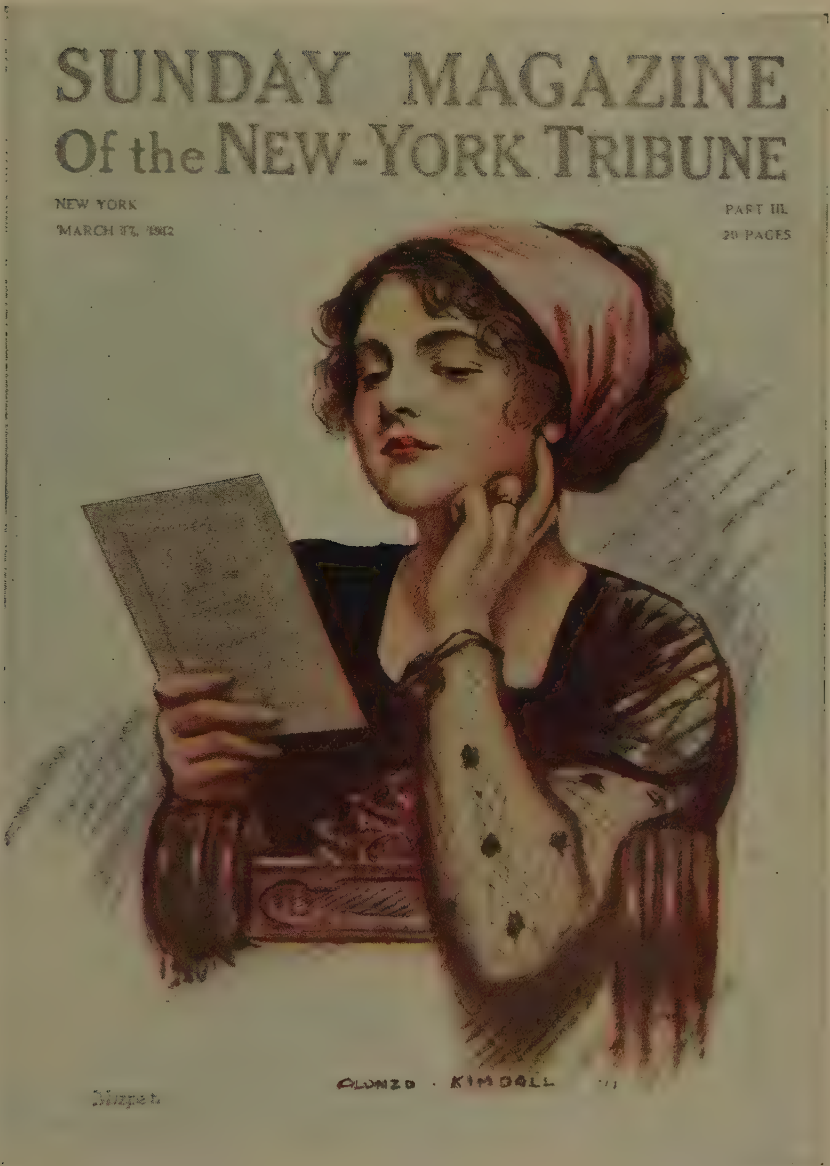

GENERAL ELECTRIC FAN MOTORS
Valve Ology
THE HOMES SUCCESSFUL
NEW ORLEANS THE GULF COAST AND FLORIDA
SPRING STYLES
American Gentleman Shoe
QUALITY TALKS.

FIG. 16

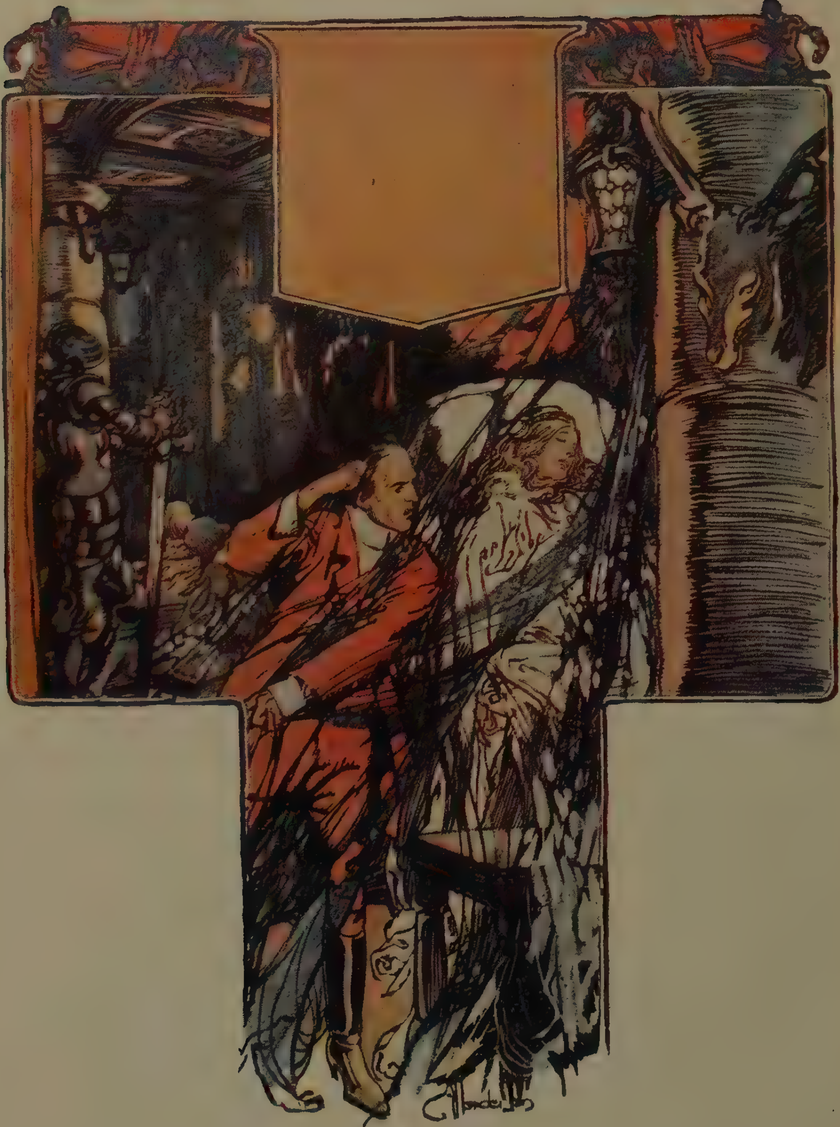


SUNDAY MAGAZINE
Of the NEW-YORK TRIBUNE

NEW YORK
MARCH 17, 1912

PART III.
20 PAGES

FIG. 17



Courtesy of The Public Ledger, Philadelphia. *Drawn by Arthur Henderson*

FIG. 18

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and would contain, in addition to the black drawing already shown there, thin outlines in black to limit the fields of the red and salmon colors.

49. Three- and Four-Color Cover Designs.—Cover designs, whether for booklets and catalogs, or for magazines and book-jackets, are coming into greater use than ever before. As in making advertisement illustrations, the artist in preparing the originals for such multicolor work paints in whatever color medium suits him best and with the greatest freedom.

By again referring to Fig. 16, some interesting examples of quadricolor work on covers can be seen. The booklet covers "The Homes Successful" and "New Orleans, the Gulf Coast, and Florida," are particularly beautiful examples, although the others, in which the bolder designs and the stronger lettering predominate, are also excellent specimens.

Fig. 17, however, serves to give a better opportunity to study a quadricolor cover. This illustration shows a small reproduction, in colors, of a cover made for the magazine section of a Sunday newspaper. The original of this drawing was done in pastels or colored chalks and was probably made four or six times the size of the reproduction here shown. The artist used carefully graded and blended hues and values on the face, throat, and hands, and on the costume, chair, background, etc., he employed strokes of the pastel pencils with good effect. This method of working should be closely studied from this reproduction, of course notice being taken that its scale is much smaller than that of the original.

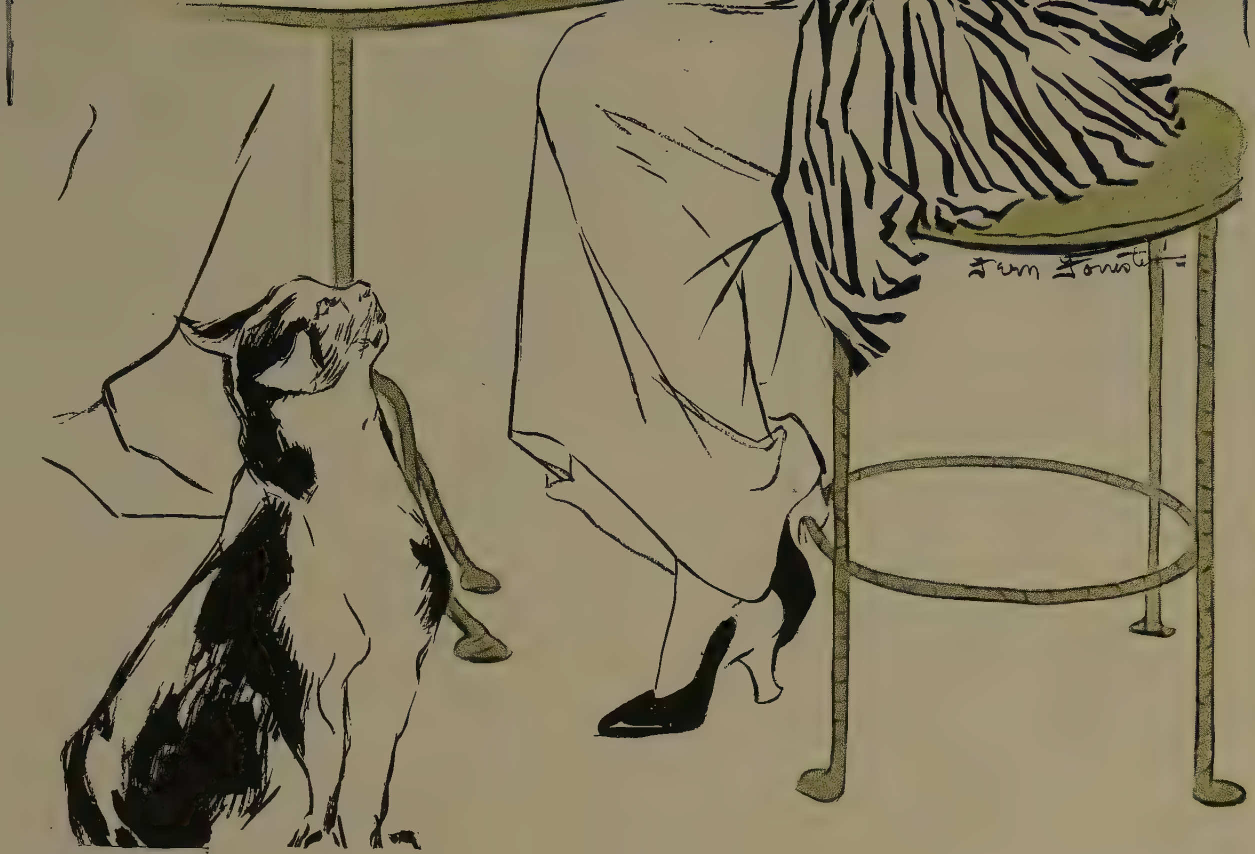
From an original drawing of this kind the engraver, with the aid of the camera to select the proper parts to be printed in black and those to be printed in orange, could just as well make a two-color blended halftone cover that would be very realistic and effective. However, as is evident from Fig. 17, results that are more beautiful are secured by employing the quadricolor process.

50. Colored Lithographic Cover Designs.—On the covers of both magazines and advertising booklets, lithographed designs are coming into extensive use. Such covers are usually printed by what is known as the *offset process*, which is really a photoengraving method applied to lithography, the process work and printing being run off on a cylinder press. Lithographed covers of this kind may be seen on catalogs of pianos, phonographs, and other musical instruments, high-grade jewelry and art work, fine stock and fruit farms, etc.

The process with which such covers are produced has already been described. The method of making the original drawings or paintings for this work is practically the same as in the case of lithographed advertisement illustrations. If the drawing or the painting is made by an outside artist, or free-lance, much freedom as to rendering and size is allowed; but drawings and paintings made by artists in the lithographer's establishment are usually made the same size as the proposed cover and conform to requirements of the lithographic printing process.

NEWSPAPER ILLUSTRATIONS AND CARTOONS

51. Types of Newspaper and Cartoon Work in Colors. As has already been shown, the great mass of newspaper illustrations, caricatures, cartoons, comics, and similar work is made in black-and-white line, mass, or stipple, in pen and ink, in crayon, or by the aid of the mechanical shading films, and then reproduced in black and white by line-engraved plates. There are many cases, however, where such work appears in color. The Sunday supplements of many newspapers have one or more colored sections—magazine section, women's, or fashion, section, comic section, etc.—in which the work ranges all the way from high-class multicolor work in halftones down to one- or two-color work from zinc etchings. The colored comics in the newspaper section devoted to that work are reproduced in simple outlines and masses of color, as is explained later. In the most prominent of the humorous weekly magazines, color work is used on both the covers and the inside pages to illustrate jokes and other items; in some cases, such color work is quadricolor halftone work, and in certain of the "smart" type of humorous magazines it has a lithographic effect. The different Sunday newspapers and their



Drawn by Fern Forrester

Fig. 19

Courtesy of The Press, Philadelphia.

colored supplements, as well as the different humorous weeklies, should therefore be carefully inspected by the practical worker, so that he may become fully acquainted with the various methods and processes used.

52. Methods of Drawing Newspaper and Cartoon Work in Colors.—Although customs and methods vary in the art departments of different newspapers and humorous weeklies, there are certain general methods of drawing for such color work that should be known by the young illustrator.

The two-color and quadricolor work on commercial advertisement illustrations and cover designs has already been discussed. In the colored magazine sections of some of the metropolitan Sunday newspapers, some three-color halftone work is also used. In Fig. 18 is shown a reproduction, on a reduced scale, of three-color halftone work for such newspapers. The original drawing, executed on illustrators' board, in opaque water color and wash, mostly with the brush, was laid out so as to extend across four colums of type and to extend down at the lower middle portion over two adjacent columns.

53. Much of the color work appearing in Sunday newspaper magazine sections, however, is done by making the original drawings largely in line, not necessarily with pen alone, but frequently with brush, and then using shading films of various textures on the plates, the color printing from which shows such skilful blendings as to resemble closely halftone-process work in colors. Drawings for such work may be done in black ink with a brush, the limits of the field to be covered by shading-film work being indicated on the drawing or on the printed proof of the key plate made from the black-and-white drawing. After he has the proof of the key plate, the artist can indicate either verbally or by a little sketch just what colors are to be used. In Fig. 19 is reproduced, on a somewhat reduced scale, a typical newspaper fashion illustration in colors, the original drawing and plates for which were prepared in the manner just mentioned. To get the best effect for the reproduction used here, however, the flat greens of the trees, chair seat, etc., and the flat blue in the background, were produced by a halftone screen combined with the shading films. The table top, the girl's hat and dress, the cat, and, in fact, the greater portion of the lower part of the picture, are in line only, no shading film or halftone screen being employed.

54. In the case of the series of comics that are printed in colors in the comic section of the Sunday supplements, very much the same practice, but in a more simple degree, is followed. The cartoonist, or comic artist, makes his drawings in black-and-white line, stipple, or mass on white cardboard, and from this the key plate is made. The shading films of various patterns are then placed where tones and tinted values are to appear, either the cartoonist or the art director indicating what stock pattern of film is to be used, as well as what colors are to be employed. The cartoonist, or comic artist, does not, as is sometimes supposed, make his drawings of the comic series in complete lines and color tints as they appear when printed.

In some of the humorous magazines of the "smart" type, in imitation of the French commercial artists, the illustrations appear as fine outlines in black with flat tones of color. The methods of making the original drawings for such illustrations have already been discussed.

MAGAZINE AND BOOK ILLUSTRATIONS

55. Types of Magazine and Book Illustrations in Color.—The illustrations in current magazines and books show every type of photoengraving or other reproductive process. Fiction magazines and books of fiction are illustrated with pictures ranging from the simplest line cuts on fairly cheap paper to the most elaborate quadricolor, photogravure color, and lithographic color work on the best grades of paper.

It is impossible to speak, even in a general way, of the various types of color work in magazines and books. Publishers have ideas and customs of the most diverse nature, and each illustrator desiring to do color illustration work for these publishers must acquaint himself with the character of the color work used in the particular publication for which he is to prepare colored illustrations.

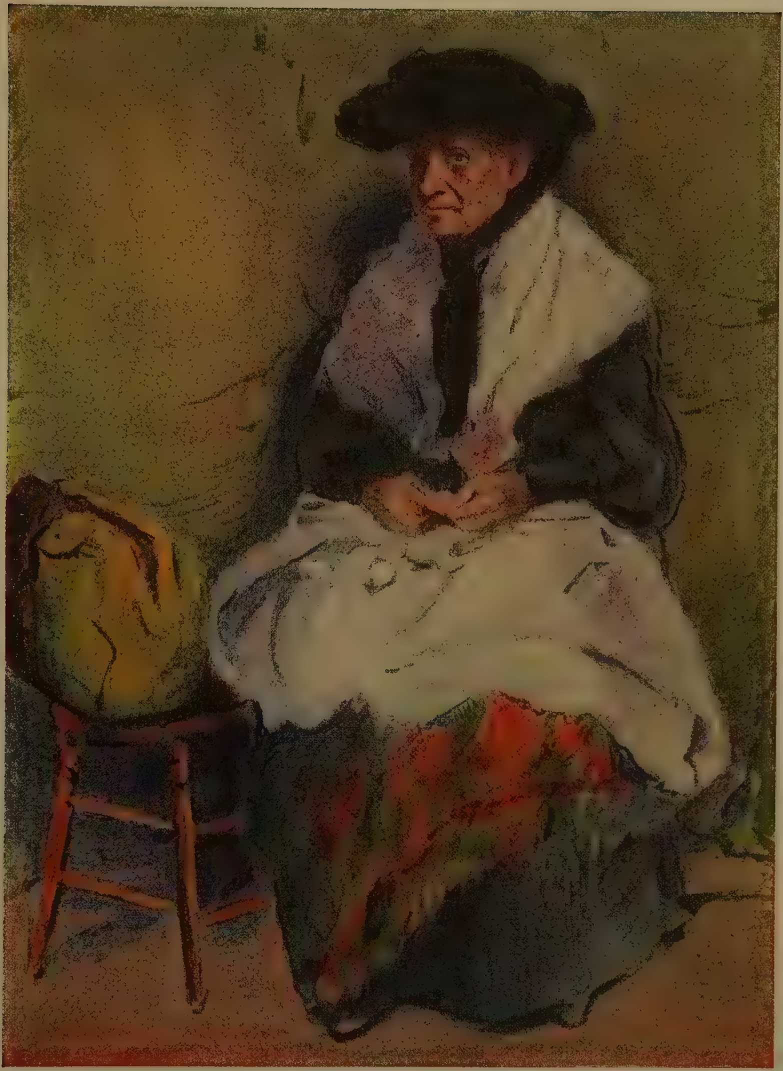


FIG. 20

56. Methods of Drawing for Magazine and Book Colored Work.—Little can be said regarding methods of drawing and painting the originals for magazine and book illustrations beyond what has already been said concerning colored illustrations for other purposes, except to advise the young illustrator to attempt such color work only after he has had considerable experience in other and more modest lines of color-illustration work.

The magazine and book field is a very wide one, as has already been pointed out, and includes a great deal more than simply current popular or fiction magazines and fiction books. There are medical, scientific, and other technical magazines and books in which the most painstaking work is required for the illustrations, frequently in black outline and flat colors. Then there are the children's books ranging from the cheap story books to the elaborate picture, or gift, books, all of which require colored illustrations, which may be made in several flat colors from line engravings, in two blended colors from two halftone plates, in three and four colors, or in lithography, from originals painted in full color. The methods of rendering these so as to be suitable for the various processes by which they are to be reproduced have already been fully discussed.

A specimen of high-grade quadricolor reproduction for fiction illustrating in magazines and books is shown in Fig. 20. Originals for such work as this may be made in oil colors on stretched canvas or academy board, in gouache or water colors on illustrators' board, or in pastels. The artist may draw or paint with the greatest freedom, concerning himself chiefly with his drawing, rendering, and composition and bothering very little about the requirements of quadricolor process work. The original for the illustration reproduced in Fig. 20 was made in water color over charcoal and then varnished so as to bring out the colors in richer hues.

OTHER COMMERCIAL ART WORK REPRODUCED IN COLORS

57. As should be clearly understood, drawing in colors is discussed here only so far as it applies to the preparation of originals that are to be reproduced in multiplied form by some printing process, and the chief forms of such color reproduction have been treated. In some cases, however, commercial artists and illustrators are called on to produce pictorial and decorative work for reproduction that does not come strictly under the classification of commercial, newspaper, and magazine and book illustrating. For instance, scene painting, artistic figure and perspective work on painted signs and sign boards, architectural perspectives and bird's-eye views in color, etc. cannot strictly be classed as color work for reproduction; yet, as such work falls to the lot of pictorial artists, the student is fully prepared to carry it out. However, the preparation of lithographic theatrical and advertising posters, such as are used on bill boards, is strictly a part of the work required for color reproduction. Such work is done by lithographers who make a specialty of this class of poster work. The lithographed pictures or posters announcing current and coming attractions at motion-picture theaters and placed on bulletin boards in front of them also belong to this general class of work. These posters are generally designed and drawn by artists employed regularly upon the art staff of the lithographing company that turns out the work. It is not customary for outside or free-lance artists to prepare such work, except occasionally to submit a small sketch in color, which, if used, is then worked up full size on stones or plates by the lithographic artists. Much of this class of work is prepared from photographs.

58. Other classes of color printers and lithographers specialize on lithographed booklet covers, calendars, picture post cards, street-car advertisement cards, and similar work. Much of this work is made up from original drawings and paintings submitted by outside artists. In preparing originals for such work, the artist or the illustrator draws or paints his picture or design just as he wants it to appear in the finished cover, calendar, post card, or street-car card. He may make the painting in any suitable medium or to any scale; but it will save time and expense for the lithographers if it is painted the exact size of the proposed reproduction. Before doing any such work, the exact requirements should be learned from the lithographer himself.

59. Still other classes of printers and lithographers specialize on labels, box and bottle covers, etc. for all classes of merchandise, staple groceries, drugs, perfumes, etc. Such work offers considerable opportunity to the artist who desires to make this class of color reproduction his specialty, particularly if he is skilled in decorative lettering.

DRAWING EXERCISES FOR COLOR REPRODUCTION

GENERAL INFORMATION

60. Work Required.—Although the student has already had extensive training in drawing and painting in the prominent color mediums—water colors, oil colors, and pastels—yet, as a test of his comprehension of the requirements of drawing for color reproduction, he is required to submit four sets of colored drawings or paintings to the Schools for criticism and advice.

Since these exercises are to serve simply as a test of the student's knowledge of the processes, it will not be necessary to make original paintings. If desired, copies may be made, on an enlarged scale, of the illustrations in this or any preceding Section devoted to color; or a colored drawing or painting previously submitted for some other purpose, as for an Exercise in water color, oil color, or pastel rendering, may be submitted again for this present purpose.

61. Character of Plates.—The colored drawings, whether new ones, copies, or drawings formerly submitted, will be in the form of drawing plates, four in number. It is expected that the student has by this time become so familiar with the term "Plates" as applied to the sheets of drawings he submits that he will not confuse it with the metal plates from which the colored illustrations are printed, as discussed in the early part of this Section. As far as possible, the standard size of 10 in. ×15 in. should be maintained. The conditions of rendering may be such as to prevent the plates from being rolled and sent in a drawing tube, in which case they should be packed and mailed flat, as previously explained.

The principal requirement is that proper care be observed to see that the drawings and paintings are prepared in such a way that they could be reproduced directly, without alteration, by the particular color process designated in each case. Reference should therefore be made to the portion of the text that describes the particular process in question.

PLATE 1

62. **Exercise in Two or More Flat Colors for Line Engraving.**—Submit a drawing for an advertisement illustration, a cover design, or some other purpose, in two or more flat colors, the effect to be secured by flat colors not impinging upon one another, or by superimposed colors so as to produce another color. The black-and-white drawing of the key plate, with the fields of the other colors to be used indicated in outline, must be one and one-half times the size of the proposed print, and must be so made that the various plates to print the individual colors can be made. A completely colored drawing, about the size of the proposed reproduction, should also be submitted.

63. **Final Work on Plate 1.**—When completed, write or letter on the back of the sheet the title, Plate 1: Drawing for Color Reproduction, class letters and number, name and address, etc., and send the plate to the Schools for examination and criticism. Then proceed with Plate 2.

PLATE 2

64. **Exercise in Combination Line and Flat Color Work.**—Submit a drawing to be reproduced as a fashion illustration, a newspaper feature illustration, or a colored comic series, the reproduction to be in line and tinted values.

The original drawing will therefore be simply a line, stipple, or mass, on a somewhat enlarged scale, in black and white, with pen or brush, on white paper or cardboard, the shading films to be used at various places being clearly indicated by lines in blue pencil, which do not photograph, and the colors desired for the final print being also indicated. It will in this case be of assistance to the Instructors if a small sketch or chart in colors is submitted with the drawing.

65. Final Work on Plate 2.—Write or letter on the back of the sheet the title, Plate 2: Drawing for Color Reproduction, class letters and number, name and address, etc., and send the plate to the Schools for examination and criticism. Then proceed with Plate 3.

PLATE 3

66. Exercise in Two Blended Colors for Halftone Engraving.—Submit a painting for a cover design or some other illustrative purpose in two blended colors, orange and black. The picture should be so painted that a reproduction can be made by two halftone plates, one printing in orange ink and the other in black ink. The painting must be made in opaque pigment (gouache), *not* in thin washes of water color. There should be some blending in the original painting, so that the reproduction will show pure orange and pure black, both graduated, as well as a suggestion of flesh color, brown, bluish gray, etc., but produced only with the orange and black.

67. Final Work on Plate 3.—Write or letter on the back of the sheet or painting the title, Plate 3: Drawing for Color Reproduction, class letters and number, name and address, etc., and send the plate to the Schools for examination and criticism. Then proceed with Plate 4.

PLATE 4

68. Exercise in Multicolor for Quadricolor Halftone Engraving.—Submit a painting for a cover design or for magazine or book work in multicolor; that is, painted in as many colors as desired, so that it may be reproduced by the quadricolor halftone process. A new painting may be made, or one that was previously submitted in connection with opaque water-color work, oil-color work, or pastel work may be sent in.

69. Final Work on Plate 4.—Write or letter on the back of the sheet or painting the title, Plate 4: Drawing for Color Reproduction, class letters and number, name and address, etc., and send the plate to the Schools for examination and criticism.

If any redrawn or rerendered work on any of the plates of this Section has been called for and has not yet been completed, it should be satisfactorily finished at this time. When all the required work on the plates of this Section has been completed, the work of the next Section should be taken up at once.

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NOTE.—In this Volume, each Section is complete in itself and has a number. This number is printed at the top of every page of the Section in the headline opposite the page number, and, to distinguish the Section number from the page number, the Section number is preceded by a Section mark (§). In order to find a reference, glance along the inside edges of the headlines until the desired Section number is found, then along the page numbers of that Section until the desired page is found. Thus, to find the reference "Advertising agencies, §17, p2," turn to the Section marked §17, then to page 2 of that Section.

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